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TEXTILE WORLD,

and
Industrial
Record.

TABLE OF CONTENTS, - - - - Page 21
CLASSIFIED INDEX FOR BUYERS - - Page 121

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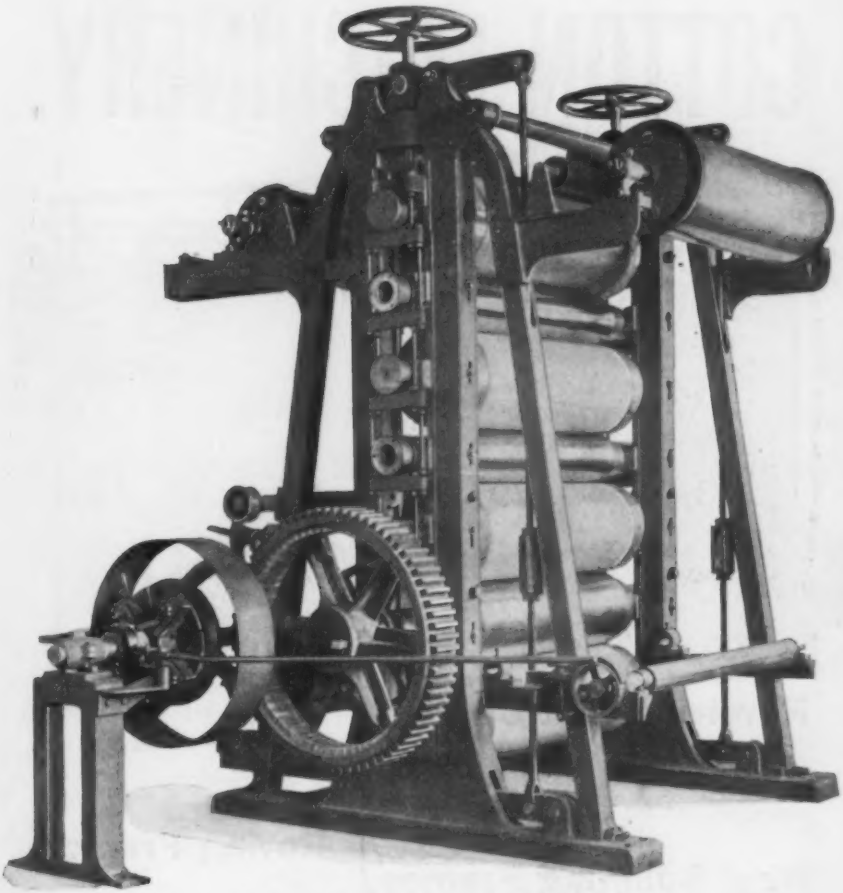

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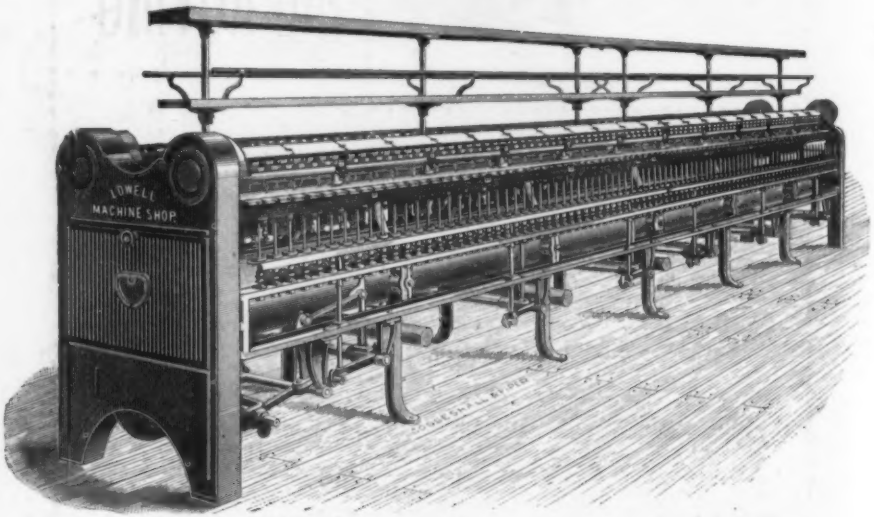

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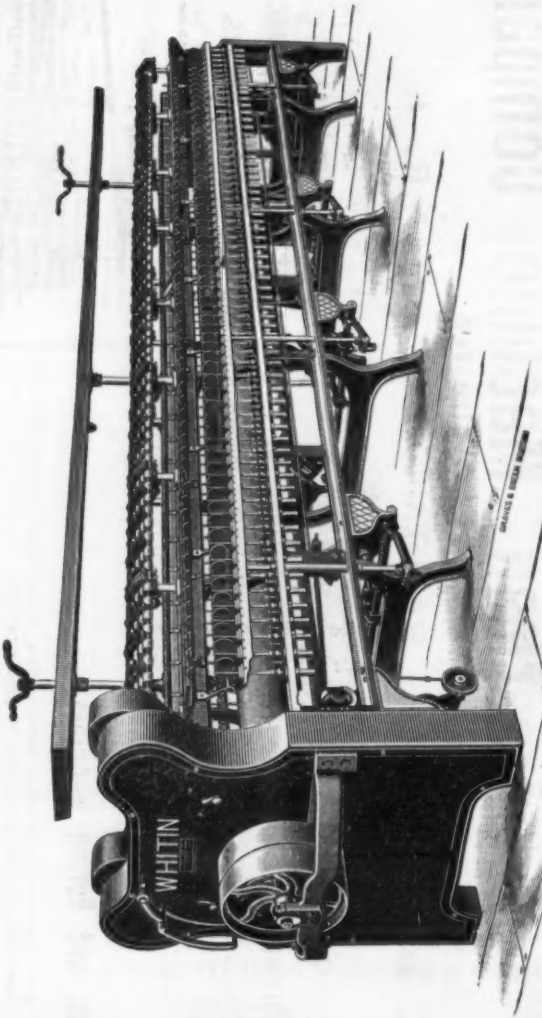

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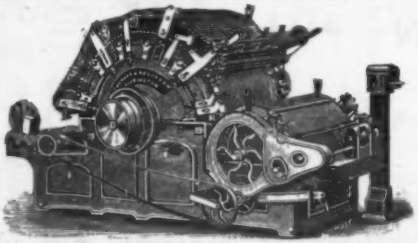

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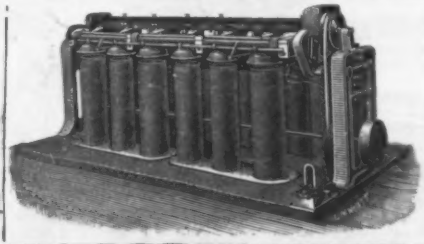

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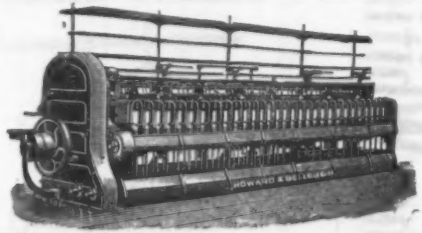

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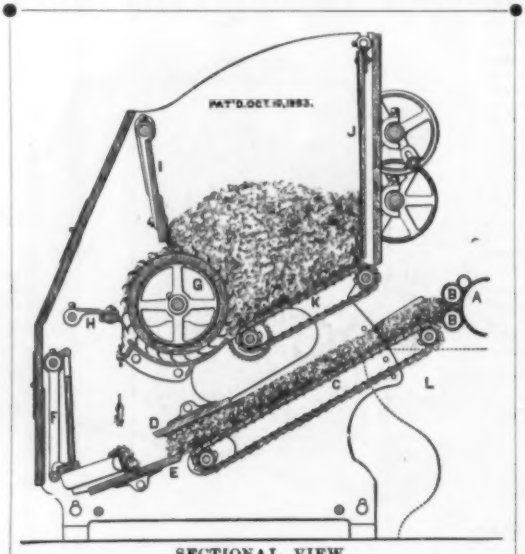

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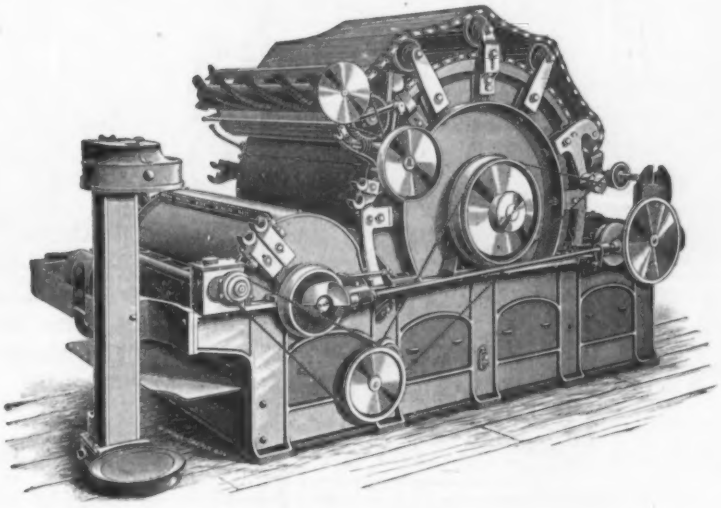

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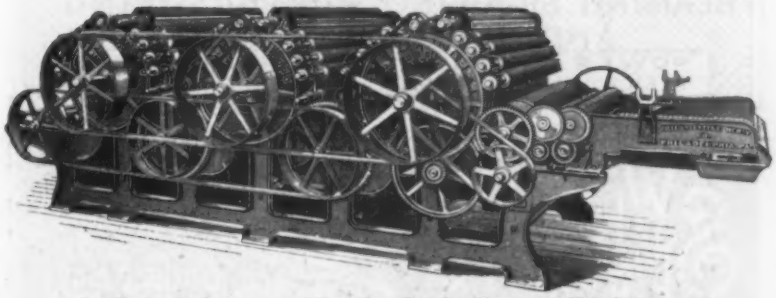

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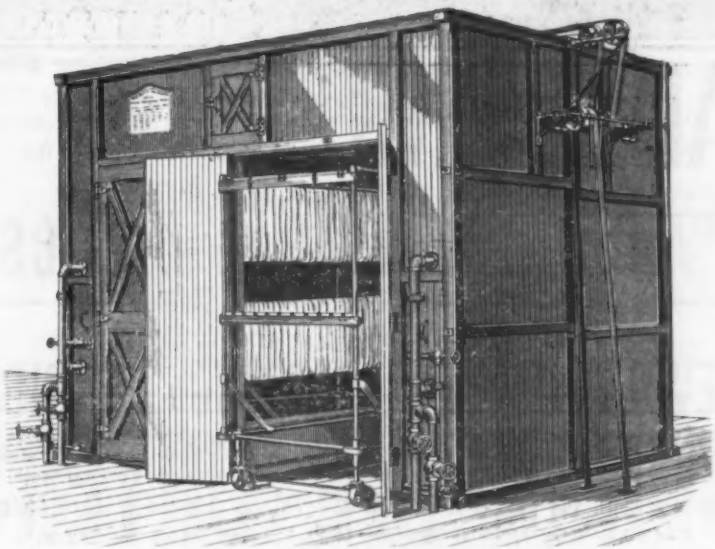

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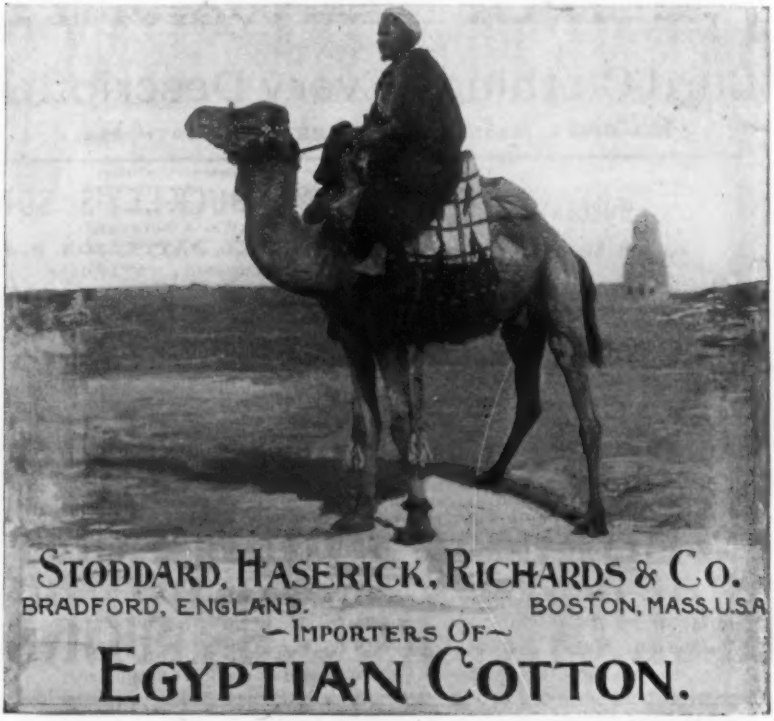

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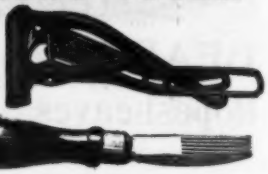

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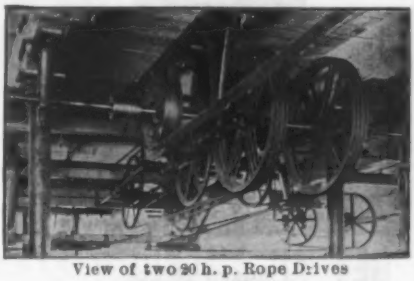

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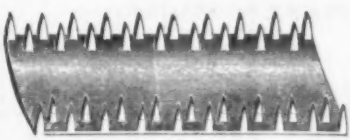

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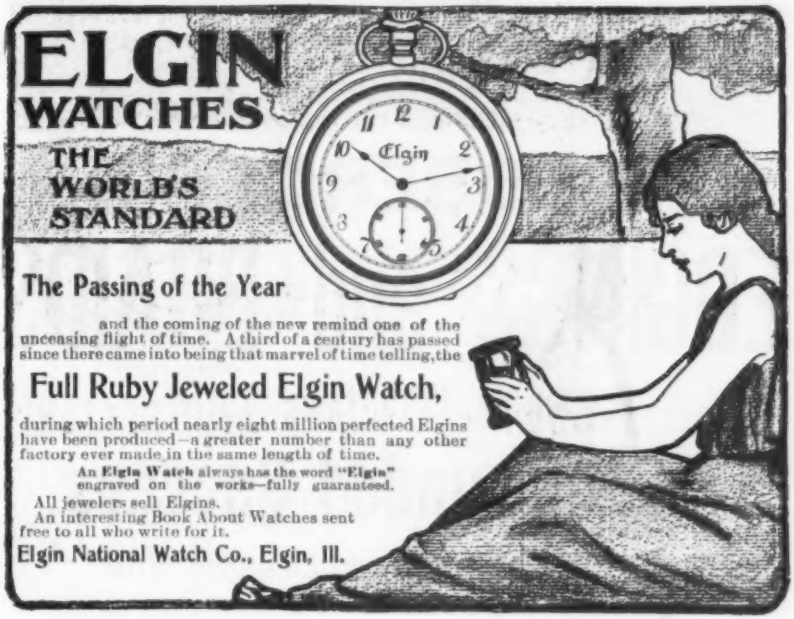
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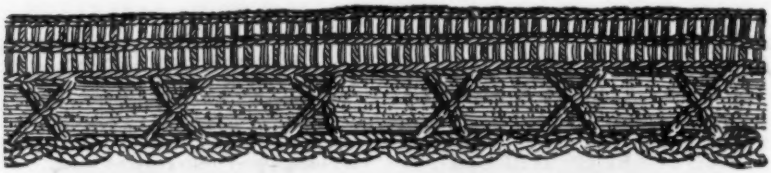

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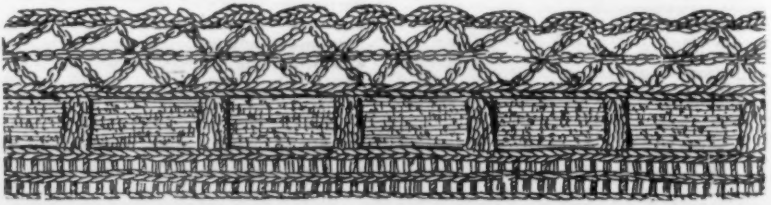

Textile World

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Special quarterly issues are published in January, April, July and October; one (January) being a statistical issue, and the others devoted especially to the cotton, knitting and woolen branches, respectively.

CONTENTS.

	PAGE
Portrait and Sketch of George A. Abbott	27
State Aid to Technical Education	29
Trade in Textiles	32
Kahki	34
The Linen Industry	35
The Adaptability of Wool	36
The Wool Exchange	37
Advantages of Country Mills	38
Cotton Spinning Industry in China	39
Mercerization of Cotton—Inventions	45
European Fall Lines	53
American Silks at Paris Exposition	54
Cotton Department American Cotton Spinning Machinery—Questions and Answers	56
Woolen Department Ingenuity in Modern Textiles—Some Causes of Defects in Textiles—Electricity in Wool	65
Knitting Department The Knit Goods Situation—From Chemnitz—Hosiery Machinery—Improving the Standard—Removing Vegetable Matter from Wool—Changes in Australian Wool	74
Power Department Back Pressure vs. Exhaust Steam Heat—Valuation of Textile Manufacturing Property—Pure Water for Textile Mills	82
Dyeing Department Dying Recipes 17 to 32—New Dyes—Finishing Dyed Goods—Mercerizing Cotton Yarn	89
Yarn Department	135
Questions and Answers	97
New Publications	99
Industrial News	101
Mill News	103
Personals	111
Special Advertisements	117
Situations Wanted	129
Textile Patents	23
Recent Sales of Mill Shares	116
Textile World's Directory	174

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George W. Gregory, in November, 1874, resigned his position as Principal Examiner U Patent Office to enter the firm.

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Mr. George W. Gregory, of Crosby and Gregory, has taken out for us since January, 1875, more than two hundred patents.

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Mr. Van Everen, of our office, was for a number of years an Examiner in the U. S. Patent Office, in the Division of Textiles.

List of Textile Patents.

Issued December 27, 1898, and January 3, 10, 17 and 24, 1899.

Chenille and Chenille Fabric. 616,748. J. S. Templeton, Glasgow, Scotland.

Combing Machine Frame, Cotton. 616,794. J. T. Meats, assignor to Mason Machine Works, Taunton, Mass.

Cotton Gin. 616,761. W. H. Baskin, assignor of one-half to W. M. Toomer, Way Cross, Ga.

Cotton Gin, Multiple. 616,466. T. F. Hutchinson, Chicago, Ill., assignor to American Cotton Company, New York.

Carding Engine Dividing Apparatus. 616,946. A. Lejeune, Verviers, Belgium.

Cotton Gin Grid. 617,229. M. D. Daroovala, assignor to Ralli Bros., Bombay, India.

Carding Apparatus. 617,481. W. J. Donigan, assignor to two-thirds to J. K. Stewart and G. A. Clark, Amsterdam, N. Y.

Combing Machine Rollers, Bearing for. 617,465. J. R. Hoyle and H. Colburn, Keighley, England.

Cloth Doubling Machine. 618,379. J. Edmunds, assignor to A. M. Goodale, Waltham, Mass.

Cotton-sack Carrier. 618,087. W. G. Hamilton, Tona, Tex.

Fibre, Refining Vegetable. 616,988. B. S. Summers, assignor of one half to C. O. Boring, Chicago, Ill.

Fabrics, Making Colored Designs on Woven. 617,772. F. Rettig, Mulhouse, Germany.

Knitted Fabric, Striped. 618,017. H. Swinglehurst, assignor to R. W. Scott, Philadelphia, and L. N. D. Williams, Ashbourne, Pa.

Knitting Machine. 617,820. W. Spiers, Leicester, England.

Knitting Machine. 616,600. W. W. Burson, Chicago, Ill.

Knitting Machine. 616,601. W. W. Burson, Chicago, Ill.

Knitting Machine. 617,089. J. F. Nelson, Rockford, Ill.

Loom. 618 362. C. A. Littlefield, Lowell, Mass., assignor to Draper Company, Portland, Me., and Hopedale, Mass.

Loom Let-off and Take-up Mechanism. 618,291. J. Poyser, Wirksworth, Eng.

Loom Let-off Mechanism. 618,363 J. H. Northrop, Hopedale, Mass., assignor to Draper Company, Portland, Me., and Hopedale, Mass.

Loom, Narrow Fabric. 618,214. O. A. Steere, Providence, R. I., assignor to Hope Webbing Company, Pawtucket, R. I.

Loom Protector Mechanism. 618,374. M. I. Bigelow, Hopedale, Mass., assignor to Draper Company, Portland, Me., and Hopedale, Mass.

Loom Shedding Mechanism. 618,232.

(Continued on next page.)

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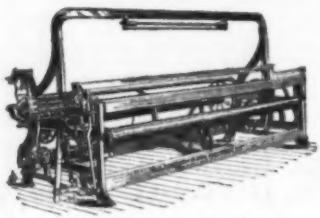

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Loom. 617,311. W. S. Thomas, Boston, assignor of one-half to Whitin Machine Works, Whitinsville, Mass.

Loom Battens, Means for Securing Shuttle Blocks to. 617,191. O. W. Schaum, Philadelphia, Pa.

(Continued on page 116.)

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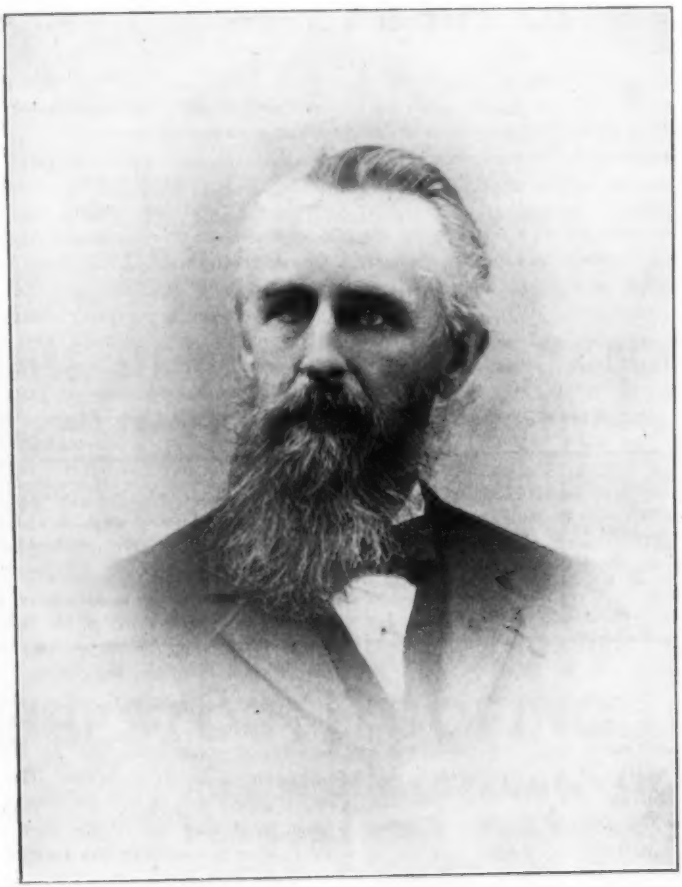


GEORGE A. ABBOTT.

TEXTILE WORLD.

Vol. XVI. FEBRUARY, 1899. No. 2.

GEORGE A. ABBOTT.

George A. Abbott of the firm of Amos Abbott & Co., woolen manufacturers of Dexter, Maine, died at his home on Church Street, December 26, 1898. He had been suffering from a cold which terminated in pneumonia. Up to within a few weeks of his death, his health had been comparatively good, and he had been about the mill attending to his duties with all the interest he had evidenced in his younger days. Had he lived until next July he would have been 70 years of age. He was born in Dexter and had always made the town his home. His father was Amos Abbott, from whom the firm received its name.

Amos Abbott and his brother Jere came to Dexter from Andover, Mass., in the year 1820, and founded the woolen mill plant of Amos Abbott & Co., and they claimed the honor of sending the first woolen cassimeres to the Boston market from the state of Maine. They worked early and late, and their business prospered. The firm took great pride in the quality of its cloth, and none better was placed on the market. In time the Abbott woolens became known throughout the length and breadth of the New England States. Never ambitious to spread, the firm always aimed to do a safe, conservative business, always paid good wages and for years divided a certain per cent. of its profits with the employees.

For the first few years the firm operated only a carding mill, and the first cloth manufactured was sold to men who peddled it out in the surrounding towns. This method of disposing of their goods was changed many years ago, and the goods now are sold through a New York commission house.

About the year 1864, Amos and Jere Abbott were succeeded by their sons George A. and Job Abbott, who have comprised the firm of Amos Abbott & Co. up to the time of the death of the former. The business of the firm prospered, and numerous changes and additions to the plant have been made, the greatest of which was the erection during the summer of 1898 of a brick weave shed, three stories high, 56 by 115 feet, with basement for finishing. The new structure is thoroughly modern in every respect.

George A. Abbott was one of Dexter's best citizens. He was opposed to ostentation in any form; his dress was always of the plainest and he worked about the mill looking after the machinery, and no employee did work that he would in any way shirk.

He was a machinist and served an apprenticeship in the employ of Davis & Furber, manufacturers of woolen machinery, Andover, Mass. He was much interested in the welfare of the town, and was one of the men most interested in building the Dexter and Newport railroad, acting for years as director in the company. He was also much interested in the extension of the railroad from Dexter to Dover, and when the company was formed he was made one of its directors, in which capacity he served for a number of years. For 20 years, up to the time of his death, he was a director of the First National Bank of Dexter.

His disposition was of the kindliest, and he had the utmost sympathy for

those who were unfortunate and deserving of aid. It can be said that his gifts to the poor were without number, and many barrels of flour and other necessaries have been left at their doors in the night time. Many a trader has received orders to deliver goods to needy families, and at the same time been admonished not to reveal the name of the donor, under penalty of securing no further orders from the same source. He was deeply interested in the Universalist Church and Sunday School, holding the office of librarian for 21 consecutive years.

The greatest of all his gifts was the Abbott Memorial Library building that stands on a lot in the centre of the village, the admiration of all visitors, and the pride of the citizens. An expenditure of $30,000 in the erection of a library building and then presenting the structure to the town, represents a sacrifice which few men would make. When the matter was first discussed, Mr. Abbott promised that if $1,000 would be raised by subscription to be used in paying for the lot, he would not only make up the balance needed, but would erect a library building to cost $20,000. The money was raised and Mr. Abbott kept his word, but instead of $20,000 the building cost $30,000, and it is one of the best in the State used for the purpose.

The structure was thoroughly built in every particular, and, in addition to a library room, there is a reading room, an art room and a large room set aside for the use of the selectmen of the town. In the latter room is found a large vault, of sufficient size to accommodate the records of the town for the next 100 years at least. The building is heated with steam and has a gas plant of its own.

Mrs. G. A. Abbott died about nine years ago. Her maiden name was Miss Lavinia Eldridge and she was a native of Dexter. Two children were born to them, Mrs. C. O. Shaw, now a resident of Huntsville, Ontario, Canada, and G. Walter Abbott who has been actively interested in the business for twenty years, and who will now succeed his father as one of the firm.

Always feeling that the Abbott Memorial Library building was not appreciated by some on account of its being an added expense to the town to properly maintain it, Mr. Abbott bequeathed to the town of Dexter the sum of $6000, the income of which to be used to partly defray the expense of caring for the building. Also that his charity work might be kept up he left the sum of $2000 to the Universalist society, the income to be expended by the charity committee of the society without regard to nationality or religious belief.

By the terms of the will the property is left in such shape that the financial standing of the firm of Amos Abbott & Co., will be in no way impaired, the woolen manufacturing business to be carried on under the same firm name, by the surviving partner, Mr Job Abbott, his son Arthur P. Abbott and G. Walter Abbott.

Egyptian cotton continues to be firmly maintained. It will not be amiss at this time to consider the condition of Peruvian cotton. The supply of full rough Peruvian cotton during the year has been a meagre one. The present stock consists mostly of good stapled old crop cotton.

The crop of 1898 shows deficient staple, caused by lack of moisture, so long prevalent in Peru. The decreased buying can be accounted for by the quiet state of trade with woolen mills, and the increased use of the relatively cheap American cotton and other substitutes, which are used where durability of manufacture is not the essential feature.

--Intelligent insurance on manufacturing property should be arranged in conformity with the methods adopted to ascertain the amount to be paid after a total loss by fire has occurred.

STATE AID TO TECHNICAL EDUCATION.

The manufacturing and commercial industries of this country realize more than ever the importance of technical education on the part of those who are to be entrusted with responsible positions in the conduct of affairs. The importance of this subject to the business interests of the country is as vital to the commercial and mercantile, as it is to the manufacturing, interests, though the latter, with special reference to textiles, is receiving more careful attention than any other industrial branch. For a long time it was regarded as sufficient to have one well-equipped and sufficiently organized school for textile instruction, located at a central point like Philadelphia; but, now, since textile manufacturing has spread over a wider area and become concentrated at different points, the value of local schools for special instruction has come to be regarded as vital to the industries directly affected.

Of late, the State of Massachusetts has awakened to the fact that, in order to retain her supremacy as a manufacturing community, she must materially contribute to the support of educational facilities, by which the artisans employed in her manufacturing establishments shall be equal to those anywhere in the world. As is well known, a textile school is under successful headway in the city of Lowell, and another has just been inaugurated at New Bedford, both being started with State and local aid. Those at all familiar with this class of schools, wherever located, whether in this country or in Europe, know that they cannot be supported upon the tuition fees of those attending them, but must receive State, or municipal, financial aid. A petition and bill has been introduced into the Massachusetts legislature, for the appropriation of $25,000 for the support of the textile school at Lowell. We should be greatly pleased if the legislature could see its way clear to grant this petition, in support of an object so essential to the material progress of the State. Massachusetts has always been liberal in appropriating money for educational purposes, without any consideration of the likelihood of many of those receiving aid leaving the State and engaging in occupations outside of it, and, therefore, contributing nothing in return. The same policy that actuates her toward her public schools should, in a large measure, influence her in the aid that she may extend to industrial education, regardless of the fact that many of those receiving instruction will migrate and contribute towards the manufacturing progress of other States. More money is devoted, or expended, for educational purposes in Massachusetts than in any other State. The relative position of Massachusetts as a manufacturing State may be better understood when it is realized that it has ten per cent. of the capital invested in manufactures in the United States. Over 25 per cent. of the employees in the textile mills in the United States are in Massachusetts, and the same proportion applies to the wages paid and the value of product. Twenty per cent. of the value of manufactured products of all kinds, in Massachusetts, is from her textile mills. There is no reason why the State should not be as liberal in the support of her leading manufactures as she is in furthering the interest of her agricultural pursuits, towards which she expends, annually, over $160,000, a considerable portion of which goes for educational purposes. The fact that the Lowell school has 61 day students, the larger portion of which are graduates of high schools or academies, shows to what extent the advantages that it offers are appreciated. Over three-fourths of these are youths of the State, the remaining one-fourth coming from adjoining States, and from two Southern States, with one from Canada.

The States of Georgia and South Carolina have taken action upon the

establishment and support of technical education in textiles within their limits. An agitation is now going on in North Carolina for State aid, towards the establishment of such a school, to be located in some central location, where municipal contribution will also be extended as an additional means of placing such a school upon an efficient basis. It is expected that about $30,000 will be thus provided, and when this is done North Carolina will be equipped with a school suitable to her wants, as a manufacturing community.

The textile school at New Bedford is already under way, with the probability of its opening its first session with the beginning of next September, with a building and equipment in every way complete for thorough instruction in practical cotton manufacturing. It will thus be conducted on more limited lines than the school at Lowell, which is intended to cover the field of textile manufacturing more thoroughly, taking not only the cotton, but the woolen, features of it, for which it is well prepared in the way of machinery and instructors to furnish as complete an education as it is possible to attain in any institution of its kind. We look upon the engagement of C. P. Brooks as director of the New Bedford school, as assuring the introduction of a most excellent curriculum for a thorough course in cotton manufacturing. Mr. Brooks's long experience and familiarity with the requirements of such a school should give it first rank at its start. The machine builders have contributed liberally all the necessary machinery to meet the needs of the school.

Technical education, however, is receiving earnest consideration in other lines than purely manufacturing, as instanced in the recent action of the New York Chamber of Commerce, which has taken up the subject of commercial education, to meet the modern conditions of commerce and industry, which call for the best talent on the part of those engaged in commercial life. It is recognized that the present educational facilities offered to business men in business colleges and similar institutions are inadequate and fail to equip them for competition in the world's commerce. In order to meet this deficiency, the New York Chamber of Commerce has formally passed resolutions favoring the establishing and development of sounder commercial education, both in secondary schools and in higher institutions of learning in this country. That some action of this kind is necessary, is realized from the attitude that is taken abroad by commercial bodies, advocating and aiding commercial education. The London Chamber of Commerce has already taken action similar to that proposed by the New York body, by granting commercial certificates to students who produce evidence of efficiency, according to the standard prescribed by that Chamber, in certain subjects of which the following are obligatory: English; arithmetic; one modern language (French, German or Spanish); elementary drawing; chemistry and physics; and the following, optional: commercial arithmetic; history, including commercial history and the elements of political economy; commercial geography; advanced drawing and stenography.

In France, the subject of commercial education has received especial attention for a number of years. In all of the large commercial cities of that country, schools of commerce are maintained, either directly, or subsidized by the State.

German cities have for a long time been provided with mercantile schools of the lower grade, which are especially devoted to the study of modern languages and the training for a commercial life; but, of late, the importance of higher commercial education has impressed itself upon the leaders in commercial and industrial enterprises, and upon governmental circles, the result being that steps are now being taken in various large cities of

the German Empire to establish higher commercial schools.

The need of a higher commercial education has impressed itself upon several of our universities, in the establishment of departments of commercial instruction, to be taken in connection with regular courses. The University of Pennsylvania was the first to undertake anything of this description, and founded a department of finance and economy, as long ago as 1881, in which a four years' college course is given, at the end of which a degree is conferred. The curriculum consists of public law and politics, including public administration in the United States and other countries, mercantile law and practice, including accounting, history, economics and social science, besides banking, currency, and the revenue system in the United States and foreign countries. The University of Chicago opened a similar branch last fall, and the University of California did the same last summer. All kinds of business require better educated men than ever before. Statistics show that but one per cent. of the American young men go to college, and from this number come 58 per cent. of the legislators, judges, and other prominent public officials. A considerable proportion of our successful professional and business men are college bred. As a matter of fact, only five per cent. of American boys enter a high school. Ninety-five per cent. go to work before reaching the high school age. Go among mercantile houses who are in want of boys to grow up in the business, and one of the first requirements is that he shall be a graduate of a high school, or, at least have passed through all of the grammar grades.

—The part that mercerized cotton yarn is taking in the manufacture of textiles is of constantly growing importance, in its utilization with silk and worsted for the production of most novel and attractive effects in design. The discoveries that are being made of the effect of strong caustic alkalies upon the cotton fibre, are leading to new methods for obtaining a permanent lustre upon the fibre itself, and, consequently, upon the yarn into which it enters. The lustre upon the cotton is due to chemical and structural changes in the fibre and to mechanical tension while these changes are taking place. This is a matter of vital importance that must be considered, and which is referred to with considerable detail in the article that appears in this issue on the subject of mercerization. Cotton yarn thus prepared is taking the place of certain classes of goods for lining purposes, for which mohair, alpaca and lustrous wool have been heretofore exclusively used, or it can be used in connection with yarn made from such materials to most excellent advantage, without impairing the desirable appearance of such fabrics. Because of its silky characteristics, mercerized cotton yarn can be used in connection with silk without being detected except by an expert eye. The combinations alluded to have appeared in French and English goods, and have appeared as a feature in some of the silk fabrics made in France, and in some of the mohair and alpaca fabrics made at Bradford, Eng.

—It is clear that American success in the late war with Spain was due chiefly to brain work, or intelligence, behind the guns. The contrast between the American and Spaniard, in mechanical dexterity and skill, was shown in all of the engagements on land or water. The Spaniard seems to be suffering from arrested mentality, and living upon the records of Spanish superiority of two or three centuries ago. We believe that Spain and China will be benefited in the long run, because of their recent defeats in war. Certainly it is to be hoped that some good may be derived from their misfortunes.

—The New York Cotton Exchange has adopted new rules for the classification of cotton, in which the length of staple becomes an important factor in determining the price of deliverable cotton. This gives an advantage to such cotton as is grown in the fertile lands of the South-west, over that grown in the South Atlantic States. Allowance for staple can not be claimed unless at least 80 per cent. of the cotton delivered shall have a length of staple over one inch, by actual measurement, and such allowance, if made, shall not exceed one-fourth cent per pound, and shall be calculated in 32nds of a cent per pound. An extra charge is made for stapling cotton. The Exchange has also placed tinted and stained cotton on to a better basis than heretofore, the recognized grades of which run from low middling to strict good middling.

—It appears from recent statistics that there are in the cotton spinning and weaving mills of Japan, 907,967 spindles, of which 850,542 are ring and 57,425 are mule spindles. The average count is given at 18, or ranging from 6½ to 40¼. The average quantity of cotton consumed per month is given approximately at 26,663,474 pounds. The number of hands employed daily is given as 14,183 males and 50,326 females, receiving average wages per day, per hand, respectively, 24.80 and 14.86 sens, a sen equalling 4/5 of a cent, United States currency. As will be noted, about 78 per cent. of the labor is female, and 22 per cent. male, giving to each employee an average of 14 spindles. According to the United States census, the average wages of the American cotton mills were about $1 a day in 1890, and an average of 65 spindles to each employee.

—The Merrimack Manufacturing Company, Lowell, Mass., are contemplating putting up a 25,000-spindle mill, somewhere in Madison County, Alabama. Should this be undertaken, it would be an important movement of Northern capital into the South, for textile manufacturing, and will go further than any amount of argument to show the advantages of that section over New England, for the making of certain grades of cotton goods. Alabama, in some respects, is an attractive location for manufacturing establishments, as noted in the erection of a large cotton mill at Gadsden, by the Dwight Manufacturing Company, Chicopee, Mass.

—The statement has been made that steam power at tide water is as cheap or possibly cheaper than water power inland, and of course, if true, the advantages in freights and the nearer proximity to commercial centres is apparent.

—A. E. Adams stated at a meeting of cotton manufacturers, that having tested many styles of travelers under varying conditions, on various sizes and makes of rings, his experience is that a very wide traveler and small circle give the best results.

—Good running spinning and good yarn are not entirely dependent on the ring traveler.

THE TRADE IN TEXTILES.

The remarkably healthy condition of business throughout the country remains, with every prospect favorable for its continuance. The strength in manufacturing and mercantile affairs is in many respects most remarkable. If there is an exception to this broad statement, it applies more to the textile than to any other line of industry. Great public confidence continues in the stability of business, the only danger being that, with the vast supply of unemployed capital, speculation will be engaged in to such an extent, without due regard to values, that it will lead to a sharp reaction, to be followed by a money crisis, involving many in bankruptcy.

Wool, today, is on the average twelve per cent. less in value than a year ago, and woolens, taking the whole list, about eight per cent. less.

Compared with 1897, at this time, Clay worsteds (16-oz.) are 26 per cent. higher, while dress goods are about 20 per cent. higher; but, as compared with a year ago, these are respectively 14 per cent. and 20 per cent. less. The present condition affecting woolen goods is favorable to a healthy trade for the current year, which should keep the mills in operation with fair profits. The sensation in the shape of a reduction in the price of goods made at the Washington Mills, was of a temporary nature, lasting only during the time when these mills unloaded their supply of goods, when an advance was made that is likely to remain permanently, if not still further added to.

The position of wool is very strong, due to domestic and foreign conditions affecting the price. There is no reasonable prospect of manufacturers being able to secure a supply at a less price than that now ruling, and the chances are extremely favorable for a decided advance, and a more active market may be looked forward to. The recent London sales of Colonial wools, which closed with the first of the month, exhibited a scarcity of desirable wool for European or American consumption. Prices at these sales, closed at 7½ per cent. above the opening, on merinos, and 10 to 15 per cent. on crossbreds. Very little was bought for America trade, as the market on this side offers no inducement for the disposal of such wool at a profit, but what was bought, to the extent of about 5,000 bales, was on manufacturers' account, and consisted largely of crossbreds, which were imperatively wanted for the class of goods for which they were intended.

As we have frequently stated, and which is well known throughout the trade, merino wool of all descriptions is in short supply, and eagerly taken, here and abroad, at full prices. Fine crossbreds sympathize with this strong position of merinos, stimulated by an active demand from domestic and European manufacturers. It was noted at the last Colonial sales of wool that medium and coarse lustrous sorts were in particular demand, at an advance of 15 per cent. over the hesitating bids of the previous sales. How long a comparative shortage will exist in the supply of fine merino wool, it is impossible to determine from any evidence that can now be shown, as there is nothing to be seen that will lead one to suppose that an increase in the production of such wool will exhibit itself as coming from either Australia or the Argentine Republic. On the other hand, all of the conditions that now surround sheep husbandry in those two countries, indicate more attention being given to the raising of crossbred sheep for mutton, the demand for which has greatly increased, on account of the better facilities for the transportation of carcasses, uninjured, to distant markets. People, also, are becoming to realize the value of mutton as a delicate and nutritious food. But, aside from this, the raising of fine wool in Australia, and the same applies to other countries, is being driven away from the fertile fields along the mountain ranges, on to the sandy plains of the interior, where disastrous droughts are almost yearly contended with, to the detriment of the staple. What the ultimate effect of this will be, it is impossible to say, but it must result still more to the prejudice of fine wools and the cheapening of the lower grades, upon which manufacturers will be forced to go, in order to produce goods at a price that will meet the popular demand. Incidentally, let us note the increased consumption of wool by English manufacturers, which largely exceeded, for 1898, that of any year within the last ten years; and the importation of woolen rags for shoddy purposes which was much less in that year than in any other within ten years, except in 1892. If these statistics indicate anything, they show a decreased use of shoddy in English manufactures.

The position of cotton manufactures in the United States is much better than it has been for a long period.

All staple goods are in a strong position, the current demand keeping the market tolerably clean, with favorable prospects. Standard brown sheetings are 16 per cent. less in price than at this time two years ago, and the same may be said of standard drills. Some lines are higher than they were a year ago, but the majority are less in price. Values will be determined largely by the course of the price for the raw material, which will depend largely upon the supply of desirable qualities for spinners' use. The 1898 crop has turned out a relatively small proportion of high grade cotton. There is a great divergence of opinion among European, as well as American, speculators and users of the staple, regarding the prospective value of cotton. So long as these opinions exist, prices will remain more or less unstable. Estimates of the yield have not yet fallen below the eleven-million bale limit; but, with this yield, the season is likely to close with a large supply on hand, consisting chiefly, however, of low grades. It is thought by a large number who are in close touch with the cotton markets of the South, that should there be a decline, or even if there is no further advance, in the price of cotton, planters will be disposed to curtail their cotton acreage for the present year. We have never placed any faith in predictions of this kind, as we know that they are not to be depended upon, as the natural inclination of planters is to put as much land as they possibly can into cotton, as it is the only crop upon which they can obtain advances to meet current expenses, and which, at the end of the season, they can convert into money as readily as a government bond. And, furthermore, under present conditions, so long as planters are able to get 3½ cents per pound for their cotton, they will continue its growth. Anything above that price represents to them a profit, or compensation, whatever that amount may be, towards the labor time that they have put into its raising.

The consumption of cotton is rapidly increasing throughout the world, it having reached in 1898, 12,106,000 bales, of a uniform weight of 500 pounds each, against an average of 10,791,000 bales for the preceding five years, and 9,623,000 bales for the five years preceding that period. Ellison estimates that there will be needed for the current season, American cotton to the extent of 10,150,000 bales. With a good demand from manufacturers in the United States and from those in Europe, the consumption of cotton for the present season will be unusually large. The cotton spinners of England were unusually prosperous during the past year, and the Oldham mills declared an average profit of nearly eight per cent., being the largest declared for any year within the last ten, with the exception of 1890, though the profits of that year were made by what was, practically, speculation in the price of the raw material.

There remains at the ports of the United States a stock of cotton considerably less than what was on hand a year ago, notwithstanding the increased amount that has come into sight since the first of September. This is due to the large export trade, which has been far in excess of that of last year. Northern and Southern spinners have not exceeded this season, to any great amount, their takings over the same period last season. In fact, spinners have confined their demands, apparently, to their immediate wants, showing no anxiety in regard to the future course of prices.

KHAKI.

A contract has recently been made by the Quartermaster General of the United States army, for the supply of field uniform coats and trousers, made of domestic material similar to that known as khaki, which is a cotton fabric that has proved eminently satisfactory for campaigning by the British army in tropical climates. This cloth was unknown in this coun-

try at the commencement of the war with Spain, and it was a matter of much difficulty to secure suitable material to clothe our soldiers that were sent to Cuba and Porto Rico. This cloth is said to be finished by a peculiar process, which is kept as secret as it is possible by those who are manufacturing it. We have had a sample of this fabric sent to us by the Quartermaster General, which we find to be a closely woven, strong fabric, weighing about 9.2 ounces per square yard, woven on four harnesses, left hand twill—three up, one down. The warp, in the sample that has been sent us, contains about 110 ends to the inch, right hand twist, and the filling about 55 picks to the inch, right hand twist. It will thus be seen that the yarn is twisted one way, and the twill runs the opposite way; in the sample before us, one right hand and the other left hand. We are informed that some of this cloth is finished by passing it through a rubber solution. One thing is certain, however, that it is finished without any sizing remaining in it.

THE LINEN INDUSTRY.

There has appeared in some of our Western exchanges, lengthy accounts of a recent invention on the part of a chemist in Chicago, for the profitable utilization of flax, as the result of chemical methods of retting. It appears that the Albany Linen Mills, Albany, Wis., have been using flax thus prepared, working it into towels, and found it very satisfactory in every respect. These mills write us that the fibre used by them was made from different growths of flax, that grown for seed exclusively, and that grown in the northern part of the State for its fibre qualities.

The inventor, B. S. Summers, informs us that there are two chemical patents involved, and one patent relating to the digestors for economical work. The retting, he says, is accomplished in one hour, and he asserts that the flax comes out with full strength. The following table of strength tests has been furnished us, by him, which will give a very fair idea of the material. He says that he has had the flax both wet and dry spun, and some of the wet spun brought to a fineness of No. 30. The towels made by the above mentioned mills were out of No. 16 yarn; and some very fair looking towels have been made out of 16 warp yarn, with the common waste seed flax filling, and some with cotton warp and seed flax filling. We are informed that the cost of production of the fibre is between $2.50 and $3 per ton of straw, retted, with items of expense to be added to this, such as interest, depreciation, etc.

TESTS OF DIFFERENT VARIETIES OF FLAX.

Five filaments, 11 inches long, 10 inches clamped in testing machine. Average of 40 tests or 200 filaments. Breaking strain measured in ounces and filaments weighed in milligrams.

Number 1. Courtrai flax (twice steeped in the River Lys).

Number 2. Belgium flax retted by Summers' process.

Number 3. Belgium flax same as No. 2, natural ret.

Number 4. Michigan flax retted by Summers' process.

Number 5. Michigan flax same as No. 4, dew ret.

Kind of Flax.	Ave. wt. per filament.	Ave. strength per filament.	Ave. strength per mgm. of filament.	Strength compared with No. 1.	Size of filament compared with No. 1.
	Mgm.	*Oz.*	*Oz.*	$	
No. 1—Courtrai	1.14	1.96	1.71	100	1.00
No. 2—Belgium	1.30	2.06	1.58	92.5	1.14
No. 3—Belgium	1.51	2.21	1.45	85	1.33
No. 4—Michigan	1.55	1.96	1.29	75.4	1.36
No. 5—Michigan	2.24	2.29	1.02	59.7	1.96

Number 1 is considered the finest flax in the world.

—A quaint mention of the value of a colonial woolen petticoat occurs in the journal of an eminent Quaker of Flushing, where he makes the entry under date of 1683: Martha Joanna's 30 weeks' schooling and what else, is paid for by a red wool petticoat to Elizabeth Cowperthwaite.

The Adaptability of Wool.

We give below an abstract of a lecture by J. W. Turner, a well known wool merchant of Bradford, England, delivered before members of the Bradford Textile Society, on the adaptability of wool. We are indebted to Mr. Turner for the report.

The wool industry was now so subdivided that the manufacturer could buy yarns and go to work upon them guided by the highest technical education; the spinner, on the other hand, had to be guided by what was known as "the rule of thumb." Cotton, silk and flax could be compelled to take the forms desired by the manufacturer, but wool would only go its own way, and required "humoring." There was no sharp dividing line between the various classes of wool. Many qualities of merino, for example, could be made into either woolen cloth, worsted coatings, worsted stuffs, or flannel. Leicester wool or colonial crossbred, when combed, produced a top which was available for almost any purpose except the production of woolen goods, whilst the noil, or short wool, obtained from the same process could only be used, according to its fineness, for the manufacture of fancy woolen goods, flannels, blankets, or hosiery. Merino wool when combed produced a proportionately long wool or top, suitable for the manufacture of the finer grades of worsted coatings, cashmeres and Italians, but the noils were only available for making fine woolen-faced cloths, fine flannels and fine felt hats.

It was an old saying that "You cannot make a silk purse out of a sow's ear." It was equally true that a lustre Orleans piece could not be made out of pure merino wool, or worsted coating out of Lincoln hogg. To take pure lustre as an example of the way in which wools could be used, the chief sources were mohair and alpaca, which could be supplemented by the wools of Lincoln, Yorkshire and Nottingham. It must be noted in that connection that white and delicate colors were made out of mohair and English lustre wools, whilst blacks, browns and melanges could be made of alpaca, llama, or other goats' hair. Leaving the range of pure lustre, there was a large production of goods known as demi-lustre, made of such wools as Irish, North Kent, etc., and colonial crossbreds, which made serges, cords, reps, poplins, various fancies and lastings. Amongst those might be mentioned the coarser kinds of demi-lustre, such as Gloucester, Oxford, Warwick and Northampton, and sometimes Devon and Cornish. These were manufactured into camlets, lastings, braids and buntings.

Next in order came the mixed breeds, which formed a very large proportion of the growth of the United Kingdom, i. e., wools which contained in a greater or less degree a cross of the Scotch black-faced or mountain wools. Those could be made into almost anything. The pure blackfaced usually found its way into carpets, but the various crossbreds were accounted for by the manufacture of moreens, damasks and Scotch mixtures. To the same class belonged the Cheviots and the superior classes of Welsh and Irish mountain wools, which were made into goods of a quite unique character. Large quantities of the so-called Cheviot goods, however, were produced from the crossbred wools of Australia and Buenos Ayres. Some of these were known as Cheviots, tweeds, Scotch fancy suitings, Scotch fingering yarns, etc.

In the olden time the finest wool to be obtained in England was the English Southdown, excepting, of course, the very fine Saxony wool, which was largely imported into Bradford in the early part of this century. Both English Southdown and Saxony wool had now been supplanted for dress purposes by the enormous imports of colonial and Buenos Ayres wool. There remained, however, one market for Southdown

which it was not likely to lose, viz., hosiery, for it possessed an elasticity and a springiness which were not to be found in any other wool. It was principally grown in Sussex, Wiltshire, Hampshire, Shropshire and Dorset, but the Southdown blood was to be found, in various proportions of admixture, in almost every county in the United Kingdom.

There was no doubt that, during the life of the present generation, merino wool had held the most prominent position. It gained largely in popularity at the time when the public was becoming tired of lustrous and hard-haired fabrics, and for twenty-five years it had had the chief command of the market. It was soft to the touch, would take the most solid and the most delicate colors, and was available for the heaviest woolen cloths, the lightest of ladies' dress goods, and the smoothest of linings. By admixture with the well understood Leicester breed, it had produced a vast variety of crossbred colonial wool, which was the principal factor in the wool market today. With the exception of the pure lustre wool, almost any wool of European growth could be matched from the supplies of colonial crossbreds.

—As the wool industry dates back to prehistoric men, and the whole manufacture of woolen cloth and yarn, from the primitive to the perfect state, involves so much care, patience and skill, it must have exercised a potent influence on early civilization. Many curious bone combs, in the form of a rudely shaped hand, have been found among the remains of prehistoric man.

—A German patent, hardly likely to succeed, provides for producing a silky lustre by forcing a size or thickening into the material by means of engraved or smooth rollers.

—The straw matting which comes from China is manufactured from a species of reed or grass.

The Wool Exchange.

The Wool Exchange is the name given to a labyrinth of offices stretching from the back of the Guildhall in Basinghall Street to Coleman Street, and forming one of the most stirring business centres in the City of London. An English exchange writes regarding it as follows:

Life at the Wool Exchange is intermittent. There are six wool sales a year, and each sale lasts about a fortnight or three weeks. On those days there is an unusual clatter on the glass gangways, a cosmopolitan gathering quickly comes together from all parts of Europe—all is bustle and animation. The sales are regulated by the Woolbrokers' Association, a close corporation, consisting of eleven members. Only members of this association can sell wool in the auction room, and little wool is sold anywhere else. Attempts have been made to break down their monopoly, but although a certain amount of Colonial wool is exported to Continental countries directly, the London Wool Exchange still dominates the market and regulates the price. To the Wool Exchange must come the buyers of wool—manufacturers from France, Belgium, Germany, and all Continental countries. It is a wonderful institution, and illustrates the conservativeness of business and the prestige of London as the world's metropolis. Sales are arranged by the brokers when sufficient wool has been imported and consigned to the members. Every year between 480,000,000 lbs. and 500,000,000 lbs. of Australian wool is imported into this country. There are also imports from South Africa, South America, and other countries, making the total annual importation about 800,000,000 lbs. More than half this vast quantity of raw material is retained for home manufacture; but we let more than half the Colonial wool go abroad. The Australian wools are among the finest, and are much sought after by Continental manufacturers. Every country, almost every district, has its

own kind of wool. The wants of manufacturers are as varied as the qualities of wool.

Buyers at the Exchange know exactly what they want, and can estimate to a nicety what they ought to pay for it. Wool is imported in bales, bearing names and distinctive marks, which enable buyers to identify the country of origin. The morning of the sales is given to an examination of the wool at the docks. The buyers mark on their catalogues the price they are prepared to give before they meet in the auction room. Then the battle begins. One might suppose that the men nearest the auctioneer can best catch his eye, or rather his ear. The seats are allotted by the Woolbrokers' Association. Wool is sold by the pound. The price varies, as a rule, from 3d. to 1s. 9d. Ten to one the buyers fix on the same valuation, and a farthing more or less per lb. will make all the difference between profit and loss to the manufacturer. Hence the fierce competition and the simultaneous shouting of the same price. On an average lot of, say, seventy bales, the difference of a farthing per lb. would amount to £30. The foreign buyers are the most demonstrative, and shout with the greatest persistency.

To overcome the linguistic difficulties, the foreigners have invented a language of their own. Halfpenny, the greatest stumbling-block, becomes "haf," "farthing" is "farzing" or quarter. The auctioneer by long experience can apparently pick out the successful buyer by the sound of his voice. Occasionally, in the midst of the fierce babble of tongues, some one will shout "Last buyer," which magic words carry discomfiture to the other competitors. It is one of the rules of the Exchange that the purchaser of one lot has the first claim on the next. He will sometimes increase his price in order to secure a more valuable lot which follows. A dozen buyers may be shouting "ten" simultaneously when the "last buyer" will put in a bid and walk away with the prize. He has always the preference, and could "sweep the saleroom" if he liked; but, while being "last buyer" gives him an advantage, he is also liable to be outbid. The bidding increases by a farthing up to 8d. per lb., and then by a halfpenny, or, in popular saleroom language, by quarters and halfs. The successful buyers have to remove their wool from the warehouses, within fourteen days, and pay for it in cash within that period.

Advantages of Country Mills Over Those Situated in Augusta, Ga.

Editor Textile World:

The advantage that a cotton factory, located in a well chosen country place, has over one located in a city like Augusta, consists principally in lower rates of taxation and cheaper house rent for operatives. The taxes in the City of Augusta are, for State, County and Municipal, say, 2½ per cent. on a full valuation of the property; and the mill owners assert that when the age and depreciation of machinery is considered, the assessments are much above what their plants can be duplicated for at this time with new and up-to-date machinery.

What the taxation is upon mills located in country places I am unable to definitely state. The assessments, however, are rarely made on full value, and I venture to say will not approximate one-quarter the rate of the city of Augusta. The same conditions exist as regards house rents for operatives.

A city lot on which to erect a dwelling of moderate proportions will cost from $300 to $500. On this a house must be built, and the taxes, insurance and water rent must be paid, which makes cheap rent an impossibility. The country mill can get several acres for what the single lot in the city will cost.

Most of the mills in Augusta own their own tenements, which are rented to their operatives at prices from 40 to 50 per cent. less than like accommodations can be had elsewhere in

the city. Notwithstanding this fact, many of them prefer to live in houses rented by themselves. Other mills, notably the Enterprise, Sutherland and Globe, own no houses, their hands living where they please, and they have found no difficulty in procuring hands at the same rates as other mills.

One advantage the city mills have is in a better class of operatives. The most intelligent and ambitious naturally gravitate to the city; this is the case the world over.

As regards cost of power, there is no great difference. The water from the Augusta canal, owned by the city, is furnished the mills at their racks for $5.50 per gross horse power, and is as cheap as steam power can be furnished, except it be at the mouth of the mine.

When the country mill, owning its own power, takes into account the cost of land, dam, canal, and other necessary expenses of improving a water power, as well as renewal, and keeping in repair, the outlay will approximate the amount paid for power by the Augusta mills.

In the past the city mills have been paying fair wages, and the operatives have been prosperous and contented. The country mills have been paying less, and their profits have been large. Now their profits are greatly reduced, and the city mills' profits are nothing.

I give below the scale of wages paid by the Massachusetts Mills at Lindale, Ga., and the recently revised one for the Augusta Mills.

MASSACHUSETTS MILLS, GEORGIA.

Carding Dep't:	
Overseer	$3.00
2nd Hand	1.50
Section Hands	1.00
Oiler	1.00
Shafting Hands	.77
Grinders	1.21
Strippers	.62
Front Hands	.72
Drawing Hands	.55
Slubbers	.88
Speeders	.91
Elevator	.75
Doffer Boys	.44
Spinning Dep't:	
Overseer	$3.00
2nd Hand	1.50
Section Hands	1.00
Doffer Hands, .30 to	.40
Spinners, Filling, 108 Sp.	.09
Spinners, Warp, 100 Sp.	.08
Spooling Dep't:	
100 lbs.	$ .14
Slashers	.88
Warpers	1.03
Tying-in Hands	.66
Weaving Dep't:	
80 yds. 48 x 48, 2.85	$ .20
80 yds. 48 x 48, 3.00	.20
60 yds. 48 x 38	.12
90 yds. 72 x 48, Drills	.20
100 yds. 78 x 26 (30 inch Drills)	.18
Webb Drawing, 1000 Th'ds, 7c	.70

AUGUSTA (GA.) MILLS.

Carding Dep't:	
Overseer	$4.00
2nd Hand	1.90
Section Hand	1.25
Shafting Hand	.90
Grinders	1.25
Strippers	.85
Card Hands	.80
Drawing Hands	.65
Slubbers (5¼ cents per hank)	.85
Speeders (4¼ cents per hank)	.90
Elevator	.80
Roving Hands	.70
Railway Hands	.75
Spinning Dep't:	
Overseer	$3.50
2nd Hand	1.90
Section Hands, .90 to	1.15
Doffers, .30 to	.40
Spinners, 108 Sp. Warp	.10
Spinners, 108 Sp. Filling	.10
Spooling Dep't:	
80 lbs. No. 18½	$ .15
Slashers	1.05
4-Warpers No. 18½	.90
Weaving Dep't:	
52 yds. 52 x 50, 4/4	$ .14
52 yds. 78 x 46 (30 inch Drill)	.14½
Webb Drawing, 1000, 5½c.	
Webb Drills, 6c.	.90

Weaving scale based on picks per min., picks per inch, and 15 per cent. stoppage = 82c. per day for 5-Loom Weaver, or 16⅔c. per loom of 11-hours' run.

SUPERINTENDENT.

Augusta, Ga.

Effect of the Cotton Spinning Industry in China Upon the Kindred Industry in India.

WALTER C. WOOD,
Late Examiner in Cotton Spinning to the Victoria Technical Institute, Bombay.

In order to arrive at a true and correct estimate as to what, in the near future, will be the effect of Chinese competition upon the Indian cotton spinning industry, it will be necessary to compare, in as many ways as possible, the bases upon which this industry is conducted in both countries; and from the more points we can view the subject, the more chances have we in arriving at the truth. In addition to comparing the climate, mills, machinery, and work-people, we must also compare the commercial solidity of

the firms, and the ways they have of doing business.

Although Bombay is the great seat of the cotton industry in India, cotton spinning and manufacturing are to be found in many other parts of the Empire. The trade is successfully carried on in Calcutta and Madras, in the Punjaub and Central Provinces, in Southern India, and in Ceylon.

But it is not of these mills I wish to speak, as they are employed in spinning yarn for local requirements, or have exclusive markets of their own, and, consequently, will not be affected by this Chinese competition.

Bombay possesses, par excellence, all the necessary qualifications for this industry to take deep root and to flourish. Here is the great centre to which Indian grown cotton is sent, and here is by far the largest and most important market in India. During eight months of the year there is practically no rain, and the unique sight of tens of thousands of bales of cotton of all grades may be seen piled up in the open air on the huge cotton green at Colaba. Here it is bought for shipment abroad, and also for the requirements of the adjacent cotton mills.

A comparison of the progress and expansion of the trade during the last twenty years is both interesting and instructive. We find, that in 1877 there were in the island of Bombay, 31 mills, containing 8-95,204 spindles and 8433 looms, employing 20,347 workers, and consuming 1-61,220 bales of cotton of 392 lbs. each. In 1896 there were 71 mills, containing 21-86,323 spindles, and 21,335, employing 78,455 workers, and consuming 8-49,678 bales of cotton, also of 392 lbs. each.

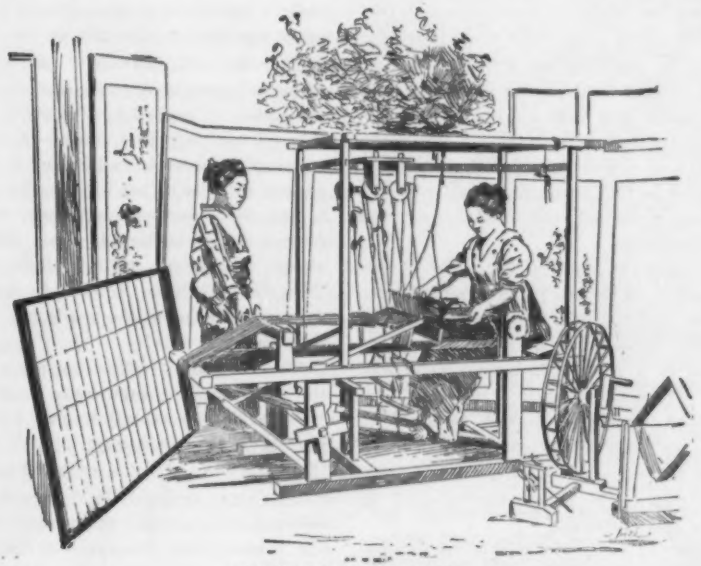
Out of a population, at the end of 1896 (before Bombay was decimated by the plague) of 800,000, roughly speaking, it may be safely said that this industry supported, directly and indirectly, one-fourth of the people. In addition to this its beneficial effects are very far reaching. Immense numbers of workers leave Bombay every year, for a month or more, to visit their native country, taking with them their hard-earned savings, either to invest in land, or to improve land already in possession of themselves or their families.

It will easily be seen that a large sum of money is thus annually put into circulation in these agricultural districts where, to say the least, there is very little ready cash floating about, as may be judged from the fact that a man's daily wage is two annas only (about twopence). Another benefit to the community is that these thousands of country people are brought immediately into contact with system, order and punctuality, and have to be amenable to rules and regulations. They are taught to be smart, decisive and obedient, and can see by the ultimate effect on their own work and wages, how much better it is for them to work systematically, than in their old habits of ease. These people are not natives of Bombay, but come principally from the South Kon Kan (Rutuagherry in particular). They are essentially agriculturists, and, as remarked before, either own land themselves, or, through their families, retain their interest in agriculture. From a commercial aspect, this is a distinct disadvantage, for each man has had to serve a sort of apprenticeship, and has only arrived at a skilful state through entailing a certain amount of cost to the concern where he may have been trained. And it does seem a pity that when this raw material should have become of value, it betakes itself again to its native country and relapses into its former state of uselessness. In order to prevent this loss of trained labor, an experiment is being tried this year, by the Bombay Masters' Association, at the suggestion of Messrs. Tata of Bombay (who are large employers of labor) of importing hands from an entirely new district. Their proposal is to import workers from the North-West Provinces.

Men, women and children find employment. The men and boys mind the machines, whilst the children are

employed in "doffing bobbins." The women are engaged in reeling the yarn into hanks, in which state it is sold, either to merchants or to consumers. It is interesting to note that the staff varies according to the caste of the proprietors or agents. If a Parsee, for instance, happens to be the managing director, then, in all the important positions his co-religionists predominate.

The hours worked are from light to dark; that is, from 6 a. m. to 6 p. m.



HAND LOOM WEAVING.

In the shortest days, and from 5 a. m. to 7 p. m. in the longest days, with half an hour's rest in the middle of the day. Of course, although the machinery is running this length of time, the individual workers are not continuously employed, for they go into the mill compound to take their meals, and to smoke their biddies, or native cigarettes, two or three times during the day.

The work is not physically hard. In reality the principal duty of the workers is to keep an eye on the machines, which have now arrived at such a wonderful state of perfection, that the greatest business they have to do is to piece up broken ends and replenish the machines with material when required, and to take away the cotton as it is completed in each process. Inside the mills the temperature is naturally high. The writer has many times taken the variations in rooms at different times of the day, and from these observations it would be safe to say that the heat varies from 90 to 110 degrees, the latter, of course, only during the hottest weather. The natives meet this by discarding clothes and only wear a piece of cotton cloth around their loins and do not appear to be much affected by it. One might think that the atmosphere of Bombay would be exceedingly dry, such, however, is not the case, except during the months of December, January and February, when the north-east monsoon blows, which, being a land wind, makes a great difference in the atmosphere. A great amount of frictional electricity is then generated by the machines, and, consequently the cotton does not spin nearly as well as when the air is more moist.

As a rule, the mills are very care-

fully managed. Much more attention to minute detail is paid than in mills in England. In all of them a daily report is made of the previous day's working, containing exact information of the minutest events which may have happened.

They give in detail, for instance, the number of hours the engine worked, number of revolutions it made, number of pounds of coal consumed, the pounds of yarn spun, the amount of waste each machine made, and a host of other particulars. This minute entering into detail is work in which Orientals excel, they take an intense delight in working out everything that can be laid hold of and reducing it to decimals, and then asking their managers for explanations. They often strain at a gnat and let thousands of rupees be lost through inability to use plain, practical common sense and promptitude.

During the last ten years the cotton industry in Bombay has progressed by leaps and bounds. To an outsider it would indeed appear as if the trade were in a most prosperous condition. On giving the matter a moment's reflection, however, one is tempted to ask one's self this question: Are these new mills the result of bona fide prosperity in trade, or are they floated as pure speculations?

Now, in India there is a very peculiar way of doing business. Suppose, for instance, three or four persons possessing a few thousand pounds between them desire to float a cotton spinning concern, what do they do? Well, they get together a board of directors, register the company, elect themselves as agents or managing directors. In their articles of association, they take very great care to insert a clause empowering them to charge a quarter of an anna (2½ cents) commission on every pound of yarn spun, or of cloth manufactured. This commission is paid to them whether the mill works at a profit or a loss.

I cannot do better than quote from a pamphlet on "Observations on the Management of Cotton Mills, and Suggestions for Amendments in the Indian Company's Act," published in Bombay in 1894.

"I would here premise that cotton mills are established not as the directors and agents of these concerns would have us believe—and as often expressed in public prints—to promote India's industries. I boldly assert, without fear of being contradicted, that these concerns are floated with the simple object of earning princely commissions. That man must have been a veritable genius who first hit upon the happy thought of charging commission at so much per every pound of yarn and cloth produced by the mills. I repeat emphatically that were it not for this happy mode of earning commission, whether the companies were working at a profit or at a loss, the directors and agents would never have bothered their brains about promoting India's industries. They would have soon left India's industries to go to the walls for what they cared."

Then, again it often happens that the directors and agents are unable to raise sufficient capital to pay for the buildings and machinery, and to work the concerns. In this case debenture shares are created, and loans are raised at a high rate of interest. With the result, that what profit the mill had made goes to the agents, in shape of commissions and in interest to loan capital. The writer calls to mind a case in which one lac of rupees annually was swallowed up in this manner, whilst the poor shareholders got nothing.

Many mills in Bombay are floated on these unsound lines, and the only conclusion one can arrive at, after carefully perusing their respective balance sheets, is that if a period of prolonged badness of trade were to set in, they would fall from their insecure foundations and general ruin would be the result. Indeed, the bad time they have just gone through on account of the plague, when nine-tenths of the hands fled from Bombay,

must very seriously have affected some of them. The agents kept as much of the machinery running as they could, and had to pay 50 per cent. more wages to the few workers who remained behind. Their idea was to keep the mills working at any cost, with the following results—less production, worse quality, greater wastage, machinery suffering through unskilful management. Some mills were entirely closed for a few weeks, but the majority managed to keep a part of the machinery working.

In addition to the agents making princely incomes from these concerns, many of their relations or friends manage to come in for some remarkably good pickings. It is really surprising what a number of separate and distinct businesses can be created, hanging onto and living upon the mills. You have, for instance, the cotton selector, the cotton broker, the muccadum or man who carts the cotton from the market to the mill, a man who makes a very respectable fortune in a very few years. Then there is the coal broker, the coal watcher, the coal muccadum, in fact where a department can be created it is, and the happy possessor of that plum soon becomes rich and happy.

As to the mills and machinery, they are fitted with the latest improvements in engines, boilers and machinery in general. No expense is spared to equip them with the most modern appliances. They can fully bear the closest comparison with the most up-to-date concerns anywhere. The work-people are skilled and attentive and use the machinery well. In most concerns there is a European manager who acts as a sort of supervisor. It is a surprising fact, that although the natives have been familiar and have become expert in the use of cotton spinning machinery for over 30 years, they have practically done nothing themselves in making improvements. They accept and appreciate new ideas as they are brought out, yet they seem incapable of originating anything themselves—an Oriental trait. They are wonderful copyists, but poor originators.

To be continued.

Paducah as a Manufacturing Centre.

Paducah, Kentucky, as a manufacturing and distributing centre for the Central and Western States, is well worth consideration by those contemplating manufacturing, and meeting the progressive tendencies of trade, in catering to the large consumptive demand for goods that is rapidly growing west of the Mississippi River, as well as through the central and southwestern sections. This city, with a population of nearly 25,000, is located in the heart of the Mississippi Valley, upon the Ohio and Tennessee Rivers, having all of the trade facilities that are offered by great navigable streams and railway systems, running in all directions, offering competing freight rates that few other places possess, and thus presenting especial advantages for obtaining raw materials for manufacturing purposes, such as lumber, cotton, wool, etc. The city holds out rare opportunities for the establishing of manufacturing enterprises of all kinds, inducement being offered by the municipality for fostering interests of this kind; and to prompt the inauguration of new enterprises, exemption of all such from taxation for a period of five years is granted. As a locality for cotton mills, it presents excellent advantages, as cotton can be obtained from different points in the South, at a freight cost of 50 cents to $1.00 per bale. The territory from which Paducah can draw her cotton produces annually about two million bales. Steam coal costs, delivered, $1.00 to $1.15 per ton, which enables steam power to be produced at the low cost of $6.00 per H. P., per annum, at a running schedule of 66 hours per week. Water for steam purposes can be got at the nominal cost of sinking a well, or obtaining it from the city

water system, at a reasonable price. Freight rates on textile factory products are 13 cents to St. Louis, 22 cents to Chicago, 48 cents to Kansas City, and other places in about a like proportion. Those thinking of establishing knitting factories should look into the advantages offered by this city, and the same may be said of those thinking of locating a woolen mill in the Central States. The woolen industry in Kentucky, we believe, has been uniformly successful. There are 23 churches in the place, of all denominations; eight public schools; ample banking facilities; electric lights; and other modern conveniences. Particulars can be obtained by writing to Geo. H. Dains, Secretary of the Commercial and Manufacturers' Association, Paducah, Ky.

Perfection Self-Heating Sad Iron.

We illustrate, herewith, two methods of ironing, one that has been long in use and followed to a considerable extent now, and the other a new method which embodies both efficiency and pleasure, which is not difficult of appreciation. The latter is accomplished by the use of what is known as the "perfection self-heating sad iron," in which either gas or alcohol is used for heating purposes. The parts of the iron to which we refer are interchangeable, and may be used either for gas or wood alcohol. Everything about it is of the utmost simplicity, and easily understood, even by a child. The irons are made in all sizes, and are alike useful for family, laundry, dressmaking, tailoring and other manufacturing purposes. They are always ready for use in three minutes from the time of lighting. No hot fires are required in summer, no danger of explosion, insuring comfort, and the saving of time, labor and expense.

One of the greatest arguments in favor of gas as a fuel, against coal, is the fact that the sale of gas ranges

has increased 50-fold over the sale two years ago. To keep three or four irons hot it is necessary to use a 2-burner gas stove, which consumes 20 feet of gas an hour, at a cost of 20 cents for 10 hours, while the "perfection self-heating iron" will only cost 2 cents to heat for the same period,

representing a saving of 18 cents per day to all users of this iron.

The success of the irons led to the formation, in January, 1898, of the Edwards Sad Iron Company, 1420 Chestnut Street, Philadelphia, with a capital of $100,000.

In August, 1898, the company estab-

lished its own plant, with a capacity of 1,500 irons weekly.

On November 9, last year, the Philadelphia Stock Exchange authorized the stock list committee to list on the exchange the stock of the company.

Mercerization of Cotton.

There have been patented in the United States, nine inventions pertaining to the mercerization of cotton. The first patent was taken out July 20, 1897, and the last one, at the present time of writing, January 10, 1899. So little was known about mercerization, commercially, at the time that the present tariff was enacted, that no allusion to it was made in the law, as undoubtedly would otherwise have been the case, with special and higher rates of duty, on account of the higher cost of mercerized yarn.

We propose, in this article, to refer to all of these patents, and illustrate those that have not already been represented in the columns of this magazine. Many of these patents are of foreign invention, and some were patented in this country considerably after their appearance abroad. In one or two instances we illustrated the mechanical devices before letters patents were secured in the United States.

It is a well established fact that vegetable fibres exposed to strong alkaline lyes are chemically changed. Such fibres acquire a very great attractive power for all dyes and corrosives, and become 40 to 50 per cent. stronger. This is attended, however, with the disadvantage that the fibres shrink, according to the strength of the fluid applied, from 26 to 50 per cent.—in hard twisted yarn still more. In many publications, mercerizing, so called after the English inventor, John Mercer, is exactly described, as, for example, in the recent book on dyeing, published in 1895, by Knecht, Rawson & Lowenthal, where it is referred to at this late date, as a process that has "never been used to a considerable extent, probably on account of the great shrinkage of the web, which increases the cost without affording to the manufacturer and tradesman corresponding advantage."

Everywhere, it would seem, attention is called to the great detriment due to shrinkage. A Lyons, France, firm, employs the property of vegetable fibre becoming shorter by mercerizing, to produce in webs peculiarly embossed effects. These webs consist of silk, and have, mostly in the chain, single cotton threads at fixed distances. If the webs are now treated with the fluids employed in mercerizing, the cotton becomes shorter, and the silk, which keeps its original length, is laid in folds, thus producing the most diversified patterns. This application of mercerizing (taking advantage of the shrinkage of cotton), has been a subject for a foreign patent.

The very great attractive power of mercerized cotton for all coloring materials and mordants is of great value. This property can be utilized in mixed webs to produce on vegetable fibres dark colors, or black, or to give silk other desired shades. Hitherto, this kind of fabric had to be colored in the skein, or black cotton woven with raw silk, and later colored in the piece. If dyeing is done with substantive coloring materials, in a proportionally weak color bath, the prepared cotton colors very dark, while silk, in consequence of the slight mingling of the colored material in the bath, remains quite light, and can then be colored in all shades. By the weaving of fast colored chains, or threads, manifold effects may be produced, just as in weaving prepared or unprepared cotton into cloths, velvets, plushes and ribbons.

The first patent taken out in the United States, was by Joseph Weiss, a Frenchman, though a resident of Germany, July 20, 1897. This invention is a chemical process for the production of white or colored crepe-like designs on cotton, linen, or other fa-

brics or yarns of vegetable origin. According to this invention, the fabric is first treated with an alkaline solution, and the parts of the fabric which are to form the design are protected by a chemically acting substance, such as acids or suitable salts or oxides. The process is carried out in one operation, that is to say, the neutralizing substance is printed on the wet fabric, impregnated with the alkaline solution in such a manner that this solution is neutralized before the contractile action, which sets in after the lapse of a few seconds, has commenced at the parts which are to receive the impression.

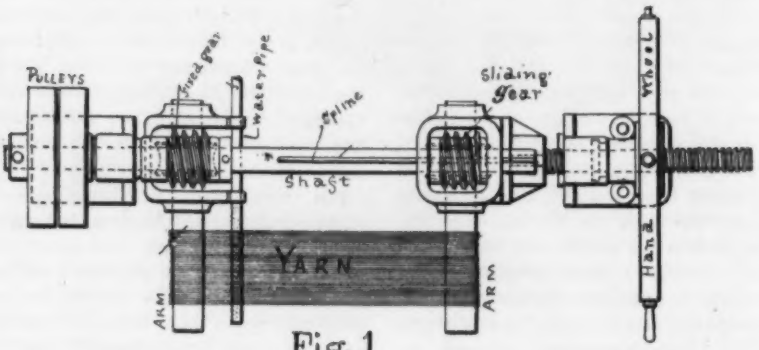


Fig. 1

The second patent was issued December 28, 1897, to Carl Tubbe, a citizen of Germany, and is a chemical process like the preceding, according to which method the textures are quickly passed through a caustic lye, with or without dilution, of a colloidal agent, whereupon they are passed through two heavily weighted cylinders covered with cloth. The material is then rolled up in order to exclude the air, which otherwise would change the fibre in presence of alkali to an oxy-cellulose. The process consists in padding the tissues with a mixture of alkaline lyes and colloidal agents, next subjecting the tissues to pressure, then rolling them up, and lastly washing them.

The third patent was issued March 15, 1898, to Richard Thomas and Emanuel Prevost, both citizens of Germany and residents of Crefeld. We have been unable to secure drawings showing the process described in this patent, which is for the treating of vegetable fibre, so as to give it a silky lustre and feel, which is obtained by subjecting the material to a stretching action, and in this condition submitting it to the action of a mercerizing fluid, until it assumes a parchment-like appearance, and finally washing, or otherwise removing the mercerizing fluid, maintaining the tension upon the whole until the latter is removed. The object is to avoid contraction by either preventing the shrinkage or by stretching. The inventor's remark that "if the fibres were washed with water before stretching, it would not be possible to stretch them to their original length; they would merely tear after slight stretching." They suggest that the best alkaline lye is caustic potash or caustic soda in a solution of 20 to 72 Tw., which, when cold, has no injurious effect upon the vegetable or animal fibres. As an acid, strong sulphuric acid of about 110 Tw. is recommended, the application of which, however, must be effected with great care and especially must be washed out well after brief action. The material thus treated shows the following valuable qualities: splendid silky lustre, greater coloring power, and 40 to 50 per cent. greater strength.

The fourth patent was also issued March 15, 1898, to Thomas and Pre-

vost. As will be noticed, these parties took out two patents the same day. The one here referred to is illustrated in Fig. 1, and relates to the process of treating the vegetable material to the primary action of a mercerizing fluid, without tension, until it assumes a parchment-like appearance, then stretching it sufficiently to prevent its ultimate shrinkage, while it is exposed to the further action of the mercerizing fluid, and finally neutralizing or removing the latter from the fibre, while it is kept stretched. In this invention, an attempt has been made to stretch long fibred and hard spun cotton during mercerizing. For this purpose, the stretching machines usually found in dyeing and finishing works have been found insufficient, and more powerful machines have had to be constructed. In this powerful stretching of long fibred or hard spun cotton, a new, surprising and industrially valuable result was discovered, namely, that the threads, yarn, cloth and other fabric took on a brilliant-like lustre. This surprising result is explained by the inventors, that, in this case, there no longer occurs a relative slipping of the individual fibres in the thread, because the friction on one another of the long and tightly twisted fibres is too great to allow such slipping, but that the individual fibres, in consequence of the powerful stretching of the goods, are themselves elongated. This development of a silky lustre on cotton, by stretching the individual fibres, it is well for our readers to bear in mind, is an important claim of the inventors as their discovery. The accompanying illustration will, we think, be understood without any particular reference to it on our part. We have given a top view of the machinery, the shaft

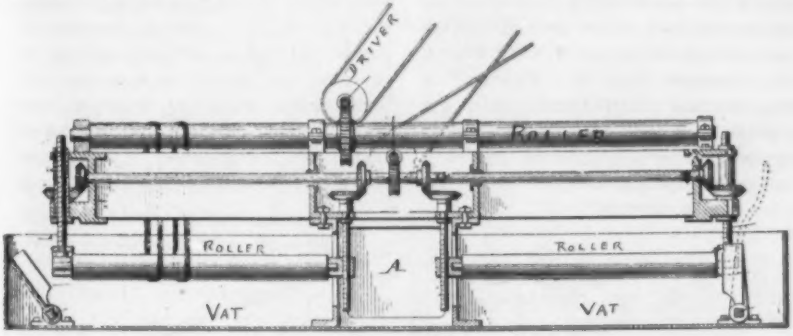


Fig. 2

being driven by pulleys, and the stretching mechanism operated by means of worm gears, one of the gears being capable of sliding on the shaft and caused to turn with it by a spline.

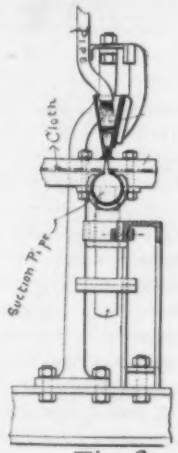


Fig. 3

The yarn is put upon two arms, as seen. During the stretching of the yarn, the arms upon which it is placed are slowly rotated by the shaft and the two worm gears. After the yarn is sufficiently mercerized and stretch-

ed, it is sprinkled with water from the water tube, in order to remove the alkaline liquor.

The fifth patent was issued September 13, 1898, to Alfred Wyser, a citizen of Switzerland, the invention having for its object an apparatus for mercerizing yarn, particularly cotton yarn, in which the hanks are arranged on an adjustable reel, which was illustrated and described in the Textile World, last October, page 59. The reel is mounted and revolves on its axis, in a vessel provided with a sprinkling device. As we described the points of this machine last October, it is not necessary for us to enter upon them here.

The sixth patent was issued November 29, 1898, to Emanuel Prevost, Crefeld, Germany, and was illustrated and described in the Textile World, July, 1898, page 95. Our information concerning this machine was first obtained from foreign sources, a number of months, it would seem, before letters patents were granted in the United States. We shall have to ask our readers to refer to our last July number for particulars concerning this device, the object of which is to impart a permanent gloss or silky finish to textile fibres and textile fabrics. This patent should be taken in connection with the two mentioned above, for which letters patents were granted March 15, 1898. Again briefly referring to these latter patents, the process covered by the first one consists in first subjecting the material to stretching, then mercerizing it, maintaining the tension during the operation of mercerizing, and finally, when such operation is completed, relaxing the tension. The process covered by the second patent differs from that of the first one, mainly in that the material is first subjected to the mercerizing action, without tension, and then after the material is wetted by the mercerizing fluid, subjected to a stretching action sufficient to produce a silky lustre and feel. While these processes produce remarkable results, it was discovered by the inventor that a more permanent and greater gloss, or silky finish, could be imparted to such fibres or fabrics, by subjecting them to pressure during the time between the dipping of them into the mercerizing liquid and the washing, or removal of the mercerizing fluid and drying, which is said to be accomplished by the later patent first referred to in this paragraph, which gives the necessary finish throughout the whole area of the material, or on portions only of the fibres or fabric so that a design or figure may be produced.

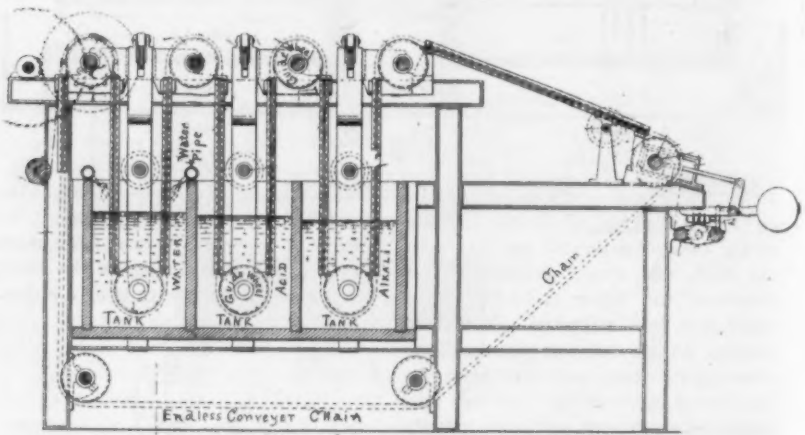


Fig. 4

The seventh patent was granted

December 27, 1898, to James R. Hope, Philadelphia, which we illustrate herewith, as Figure 2. The machine is provided with a main frame, having one or more overhanging supports, extending along the sides and having attached thereto a power driven roller, and one or more loose rollers. The lower rollers alone rotate in the liquid. Our illustration gives a transverse sectional elevation of the machine, which can be readily understood, we think, by any one familiar with dye-house machinery. By adjustment of the upper and lower rollers, any desired degree of tension may be put upon the yarn treated. When the machine is used for mercerizing, the frame A, with its rollers, is lifted up by a suitable crane, or hoisted (not shown) above the vat, and the yarn placed over the ends of the rollers. The lower rollers are then adjusted to secure the proper tension and the apparatus lowered into the vat, or the tension may be adjusted after the apparatus is lowered into the vat, as may be most convenient.

The eighth patent was also granted December 27, 1898, to Henri David, a citizen of France. We illustrate this in Figure 3, which will require but little description to be understood. This invention relates more particularly to an apparatus to be employed for preventing shrinking, and for stretching woven fabrics during the process of mercerization and subsequent processes. The mercerization of the fabric is effected by distributing the liquor upon the upper surface of the cloth, which is below subjected to suction, so that the liquid is forcibly drawn through the substance of the cloth, in such a manner that every fibre is thoroughly impregnated. The suction may be produced by any suitable means which will effect a more or less perfect vacuum. The mercerizing liquid is supplied through the pipe shown in the illustration, whence it flows into a receiver, in the bottom of which there is a series of ajutages which distribute the liquid upon the face of the cloth. The operation of the apparatus is as follows: The cloth passes at the end of the machine over the usual stretching, or tension, staves; the selvages seized and held by the points, or grippers, on the tentering chains, which should be arranged at such a distance as to hold the cloth at its desired width. The impregnation by the mercerizing solution is made at the suction pipe, and the subsequent washing done elsewhere. The inventor does not consider it essential that the washing on the machine should be very thorough, because the simple passage of the water through the cloth will so dilute any mercerizing solution left therein that it will thereafter be inoperative to produce shrinkage.

The ninth patent was granted January 10, 1899, to H. W. Butterworth, Philadelphia, which we illustrate herewith as Figure 4. The object of this invention, or machine, is to properly stretch and hold the cloth against shrinkage or contraction, while subjecting it to the action of the mercerizing liquid. In carrying out the idea of this invention, there are employed endless chains, or conveyers, with pins, or clamps to hold the lateral edges of the fabric, the conveyers passing over suitable guide wheels which carry the fabric into the alkaline bath, and then into the washing bath, with or without an intermediate acid bath. The illustration that we give to show this invention is a sectional elevation midway of the machine. The fabric is first delivered to the convey chains, and never relaxed until the operation is complete, thus obviating any handling of the fabric in the wet or intermediate operations. It will be observed that as the width of the fabric is maintained, no matter how strong the shrinking action, the commercial value, as to the width of the fabric, is not decreased by the treatment.

—The advent of the United States into the ranks of the great powers is bound of itself to raise some important questions.

Modern Wool Drying.

Until the past few years a wool dryer of any considerable capacity that was economical in labor, floor-space and heat was an unknown quantity, and, until the advent of the automatic continuous machine, advantageous drying was one of the main difficulties experienced by a woolen manufacturer.

After many long and tedious experiments, the Philadelphia Textile Machinery Company, Hancock and Somerset Streets, Philadelphia, Pa., produced their "Cyclone" automatic continuous machine for drying wool, which marked the beginning of a decided progress in this branch of the industry. Under all the old systems it was imperative that a uniformly low temperature be maintained in order to prevent harshness in the fibre (one of the chief features in successful wool drying),—consequently the capacity was comparatively small. Sometimes, however, in order to meet the requirements of capacity, a high temperature was used, greatly to the detriment of the stock.

As a result of their experiments, the Philadelphia Textile Machinery Company found that harshness was produced by two causes, i. e., a high temperature on dry stock and a lack of air circulation, or, in other words, a baking of the stock. They also learned that by subjecting the stock to a high temperature, say 180 degrees, when it first entered the dryer, and gradually reducing it by means of their successive compartment system until it emerged from the machine at the comparatively low temperature of 110 degrees, that the result obtained was in reality the same as by cold air drying.

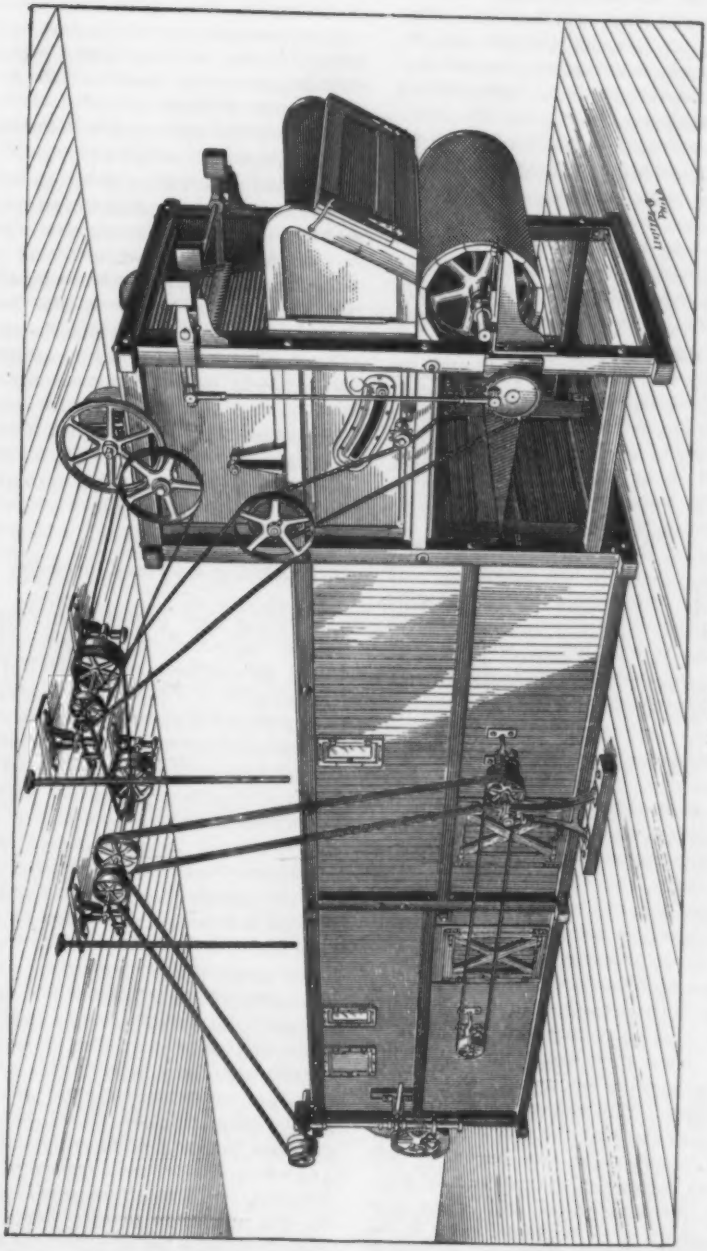
The grading of heat in the successive chambers produces a soft fibre, free from harshness when dry, which is due to the fact that on entering the dryer the stock contains its maximum amount of moisture, which counteracts the bad effects of the high temperature to which it is subjected. The actual temperature of the stock at this stage of the drying is, however, much less than that of the air in the enclosing chamber. The greatest amount of moisture is, of course, evaporated in the first compartment, and as the stock passes on through the successive chambers the temperature is reduced to correspond with the amount of moisture still remaining, until the wool finally emerges from the dryer soft and lofty, as well as dry.

These machines range in capacity from 2,000 lbs. to 15,000 lbs. per day and are built complete in such a manner that they can be readily taken down and shipped in compact form.

It is a noteworthy fact that the Philadelphia Textile Machinery Company manufacture the latest improved Garnett machinery, reclothe metallic cylinders, etc., as well as building a most complete line of drying machinery.

Tallow and Cottonseed Oil.

Tallow is sometimes, but only occasionally, used in scouring cotton goods, and its introduction into the lye is done for the same purpose as in the case of rosin—viz., the emulsification of oily matters on the cloth and their consequent removal. In purchasing tallow care should be taken that the sample is not adulterated with mineral oil or unsaponifiable matter, otherwise oil stains will result from its use. Tallow is largely adulterated, but if free from mineral oil or wax the other adulterants used will not affect its use in bleaching. The presence of mineral oil or wax in tallow can very easily be detected by boiling a small piece of the tallow with an alcoholic solution of caustic potash, and pouring the liquid so obtained into a large volume of water. If the tallow is free from mineral oil or wax the solution will remain clear, the production of a turbid solution indicating the presence of foreign unsaponifiable matter. This test will be quite sufficient for a bleacher, be-



MODERN WOOL DRYER.

cause, although it will not indicate very small amounts of mineral oil or wax, it will show whether the sample is suitable for his purpose, as the amount of oil not shown by this test would be too small to cause defects in bleaching.

Cottonseed oil is used to a small extent in the same way as tallow, and for the same purpose. It must be quite free from mineral oil or wax. Cottonseed oil is sometimes used in order to remove oil stains on cloth, which have resisted bleaching by the ordinary process. For this purpose the stains are painted over with cottonseed oil, and then sent through the bleaching process again. Generally the stains will have been removed after this treatment. The action of the oil seems to be due to its softening the more or less oxidized oil on the cloth, which is then readily removed by the soap formed as a result of the action of the alkalies on the readily saponified cottonseed oil. When the oil stains are due to mineral oil, this is removed by emulsification with the soap formed during the bleaching process.

A Scheme for Booming Manufacturing.

A suggestion has been made by prominent citizens of Georgia interested in the booming of the industries of Atlanta, that the sum of $300,000 be raised, in cash, by the citizens of that city, and put for investment into the hands of trustees selected from the ranks of Atlanta's practical business men. It is expected that these trustees can be induced to act without pay, since they would thus be giving their services to promote the city's welfare. With the sum mentioned, it is proposed that the erection of a cotton factory be at once begun, to cost, when completed, the full sum of $300,000, exclusive of the real estate upon which it is to be built, as it is believed that many of Atlanta's property owners would be glad enough to donate real estate for this purpose. When everything is in readiness, it is proposed that the trustees go into the market, and without delay proceed to dispose of the factory, even though it may be necessary to sell for less than cost. In that event Atlanta would still be getting the benefit of the improvement. With the amount realized from the sale, another cotton factory could be erected and disposed of in the same manner, and so on until the fund in the hands of the trustees is reduced to $100,000. Then it is suggested that the trustees turn their attention to other manufacturing enterprises, giving the city the benefit of the best variety in this respect, which the natural advantages of that immediate locality will permit. The scheme is endorsed by Gen. John D. Gordon, of Georgia, who says that if such a programme could be inaugurated and carried through, it would prove an incalculable benefit to the city.

Exhibit of American Products.

A bill, which passed the Senate without opposition, is now before the House, having been unanimously recommended by the committee having it in charge, authorizing and encouraging the holding of a national exposition of American products and manufactures, especially suited for export, at Philadelphia, sometime during the current year. This bill would have passed the House at the time of the committee's recommendation, but it reached that body quite late in its session, and was laid one side, due to the introduction of war measures. It has been arranged to bring the bill up in the early days of the session, and we trust that it will receive favorable consideration, and pass with a necessary appropriation to carry it into proper effect. Briefly stated, the bill provides for the holding of a national exposition, under the auspices of the Philadelphia Exposition Association; for the admission to such exposition of such articles not of American manufacture, and such other objects as may conduce to the interest of the exposition and be useful for comparison

with American products and manufactures; for the importation free of duty, under regulations to be prescribed by the Secretary of the Treasury, of the articles imported for exposition; for the sale of such articles on payment of the duties imposed thereon by the general revenue laws in force at the date of importation; for the appropriation of $50,000 out of the Treasury of the United States for enabling the collection in foreign markets of samples of merchandise in favor and demand therein, and illustrating the manner in which merchandise for such markets should be prepared and packed, together with necessary data for the instruction and benefit of American manufacturers and merchants, and thereby laying the foundation of a great system of national commercial education; for an appropriation of $300,000 to aid in providing buildings necessary for the purpose of the exposition, and for the purpose of collecting, installing, and caring for such an exhibit by the United States Government as may be found expedient and desirable.

European Fall Lines.

No. 1.

(Reported by the European Pattern Supply Co., 32 Greene St., New York.)

The manufacturing centres of Europe in the woolen industry are busily engaged in the preparation of their sample lines for the coming fall season. The lines are to a greater part finished and are being shown to the trade. In comparing the European fabrics, and especially the English, German and Belgian, with our domestic makes, it strikes us most forcibly that the former contain a great many twisted yarn patterns which are entirely obviated in American fabrics, which is due to the fact that in most of the plants in this country machines for that purpose are not being used.

A large number of our manufacturers, and especially those who have, for years, made nothing but staple suitings, do not seem to realize the importance of bringing out novelties, but confine themselves mainly to staple lines. It was the intention of the Dingley bill, not alone to protect our home industries against foreign competition, but also to elevate our industry by permitting manufacturers, with the protection of a high tariff, to experiment on desirable fancy goods, such as have exclusively been imported from Europe. The manufacturers of other industries have taken advantage of the experiences and intelligence of European manufacturers and have readily adopted their tactics.

It is well known that Europe looks with envying eyes upon our increasing inroads on the European markets in the iron, steel, machine and electrical business, and yet one of the main industries, the textile, which is receiving such bountiful protection by the enactment of the Dingley tariff, appears to be neglected in comparison with the others. It cannot be asserted that we do not manufacture a sufficient amount as to put ourselves in a position to compete in the export trade with European countries. To the contrary, our production is so immensely large that before long we will be compelled to seek outlet in other markets. How soon and to what extent this will be accomplished will depend upon the efforts of our woolen manufacturers. It is obvious that the government should enact special laws to encourage the export trade in the entire textile industry. This, once accomplished, will find the wool market in a healthier condition and soon bring up the woolen industry to a standard never before known in the history of its existence.

In looking over the English fancy lines we observe that worsted is not used to the extent as in former years. We said in our previous article that fabrics composed wholly or in part of worsted have been imitated in such a variety of cheap fabrics that the value of high priced worsted goods has been greatly depreciated and for this reason the English manufacturer is making more effects of worsted and

cheviot yarn combined. This combination gives him an opportunity to develop an immense variety in designs, and an imitation of the rich colorings is next to impossible in lower grades. Especially the brown and olive colors in all shades give strikingly handsome effects. Plaid patterns have again the field, single as well as double, and the business on them has been so successful that we can safely predict a preference for these patterns will be shown for the present fall and the coming spring season. We furthermore see a large variety in tweeds and smooth-faced cassimeres; and, as regard designs, an overwhelming plurality of check and plaid effects. These lines will command the better trade and we see that here also the finish, half melton and half velour, is predominating. The feeling and effect of this finish are perfect, and we also find the same applied to qualities of lower material which are thereby made more desirable and suitable for the trade.

Very good lines in pantaloonings are in the market from Huddersfield, Halifax and other places. Here we find a large representation of the staple worsted designs, but also a large amount of the old and genuine velour patterns. In velour trouserings, mostly fine, solid designs are represented, which accord with the quiet taste for this article; different from the worsted trouserings, in which there is a larger combination of colorings and effects than in former years. Broad designs with narrow worsted or silk effects, are again on the market, and they appear desirable in comparison with the simple staple stripes. Handsome effects are also shown in cheviot trouserings and the old herringbone effects have come to the front again. Overcoatings are being offered in kerseys and in plain and mixed meltons, in chinchillas with fine naps, also in worsteds, boucles and montagnacs, but we cannot mention anything of a novelty in this line, and, in fact, the taste for plain effects in overcoatings is so well established that the only variety which is offered from one season to another is in coloring and finish. A large assortment, however, is shown in all sorts of grays and gray mixtures, in diagonals as well as in kerseys and meltons.

This pictures about the entire line of the English manufacturer, and the latest reports inform us of a satisfactory business for the continent. There is no doubt that a large percentage of the high priced English fabrics will be exported to America, and what amount of business is thereby lost to the American manufacturers can be easily arrived at from the statistics, which show an amount equal to the production of at least 15 to 20 large mills. The English staple articles from Bradford, Leeds, etc., as presidents, beavers, repellants, will not figure in competition to the American manufacturer, neither the worsted clay diagonals. This fact is well known to the English manufacturers and commission houses, and their prospects in these lines are consequently not very hopeful.

In our next article we will describe in particular the products of Germany, which stand second in the textile industry of the world.

American Silks at the Paris Exposition.

The silk manufacturers of the United States have not come to any definite understanding concerning what they will do in the way of exhibiting their products at the Paris Exposition of 1900. There has been some talk of an exhibit of this kind, to be made by the Silk Association of America, on behalf of all manufacturers, rather than by the individual concerns themselves. The expense of individual exhibits is considerable, and there is a sentiment that little can be hoped for in the way of exporting silk textiles made in this country, which takes away the main incentive for an exhibition of this kind. However, under considerable pressure it is thought that the silk manufacturers might

consent to make a joint exhibit through their national association. It may be that the sewing silk and machine twist manufacturers, like Belding Bros. & Company, and the Nonotuck Silk Company, may be disposed to exhibit separately, as they have done at former foreign expositions. The foreign field is quite open in this branch of the trade, as the specialties of the companies just mentioned are sold in Paris and London at good prices, considering their quality.

Bristol's Patent Steel Belt Lacing.

It is now nearly ten years since The Bristol Company of Waterbury, Conn., began manufacturing their patent steel belt lacing, which has become within that time familiarly known and very generally used at home and abroad. There are over one hundred different sizes and lengths adapted to different styles and widths of belting. The illustrations, Figs. 1, 2 and 3, show the three different types that are made, of which Fig. 1 represents that originally placed upon the market and designed particularly for leather belts.

The type, illustrated in Fig. 2, was brought out later to meet the demand for a fastener for woven belts, such as are made of cotton and rubber. In this style the distance between the rows of spurs is greater than in the original form shown in Fig. 1, and thus affords a better hold on ends of a belt of a woven or fibrous nature. Both types of lacing shown in Figs. 1 and 2 have the patented feature that they are formed from blanks of a zig-zag shape, said shape being such that the blanks may be successfully cut from a ribbon of steel without the waste of material.

The latest design, shown in Fig. 3, which is now being introduced, combines the special features of both of the previously described types, the essential difference being that there are two rows of spurs on each side of the centre, instead of one. The patented features of this latest design are that

FIG. 2.

the blanks used are of a zig-zag form and that they may be successfully cut from a ribbon of steel without waste of material, each blank as it is cut off simultaneously forming one side of the blank for the next lacing.

The advantages of this new form of lacing are that it is equally applicable to leather, cotton or rubber belts, and that the double rows of spurs on each side of the joint insure great strength, especially when applied to old and partially worn belts. All the above types have been carefuly designed to give maximum strength with minimum amount of material. All three types are easily applied without use of special tools, making smooth and elastic joints. Samples will be mailed free on application to the makers.

FIG. 1.

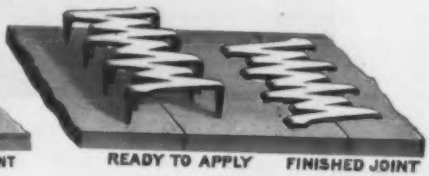


FIG. 3.

—A recent publication on mercerization of the cotton fibre, by Paul Gardner, contains some tables, illustrating the contracting action of caustic soda under various conditions.

COTTON DEPARTMENT.

23190* 98.
am. 11.

American Cotton Spinning Machinery.

ARTICLE VII. (Continued).

CHARLES CLIFTON HEDRICK.

(Copyrighted.)

There is shown in Figure 43, a half-tone of two sections of laps, taken from cards. The one marked A, is from a card provided with a feed plate while B is taken from an old one with the two-feed rolls. The point where the fibres are liberated is indicated by a horizontal line, and it will be seen that in section A, they are combed and cleaned for a much greater portion of their length than those in B, which receive very little combing before they are taken away by the leader. Many are broken by this method of feeding.

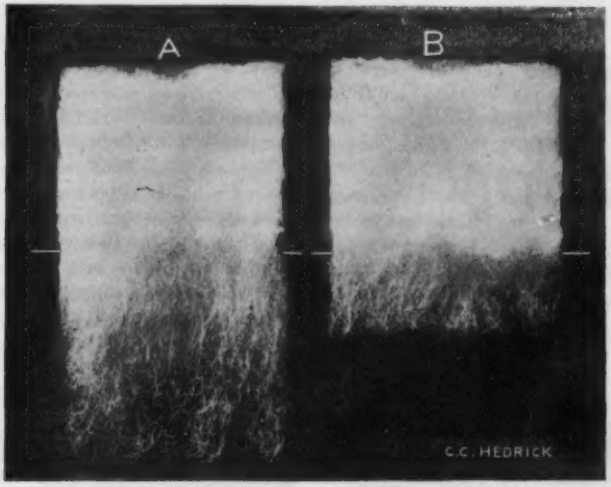


FIG. 43.

A section of the leader, the cylinder and the parts connected, and a section of a flat in relation to the cylinder are shown in Figure 44.

The mote knife D is adjusted in either direction, horizontally by moving the bracket D^1, by which it is attached to the leader shroud, and vertically by the screw D^2. The correct distance, from the teeth of the leader, may be, in this way, very easily obtained and, as the leader shroud moves with the leader shaft, when the position of the leader is changed, the mote knife moves with it, thus avoiding the necessity of resetting. Over the leader is a steel cover J, called the leader bonnet. At the point, where this cover and the back plate T come together, is placed a round iron rod I', covered with flannel. This rod serves as a fill-up piece, preventing the dust and short fibres from blowing out. Resting upon the feed roll, and between it and the leader bonnet, is another rod P, similar to the one just described. At this point, the rod performs double duty, keeping the dust from blowing out, and also acting as a clearer for the feed roll.

In the section of the flat and the cylinder, it will be seen, that the space between the wire of the flat and cylinder, is greater at the toe, or point where the cotton enters, than at the

heel, where it leaves. By inclining the flat in this manner, the fibres receive combing from the greater portion of its wires and as they stand out, slightly, from the surface of the cylinder, by being gradually drawn into a small space, are more easily dealt with than they would be if the flat were brought close at the toe.

A few words may now be said in regard to the settings of the various parts shown in Figure 44. The usual settings, although liable to a change

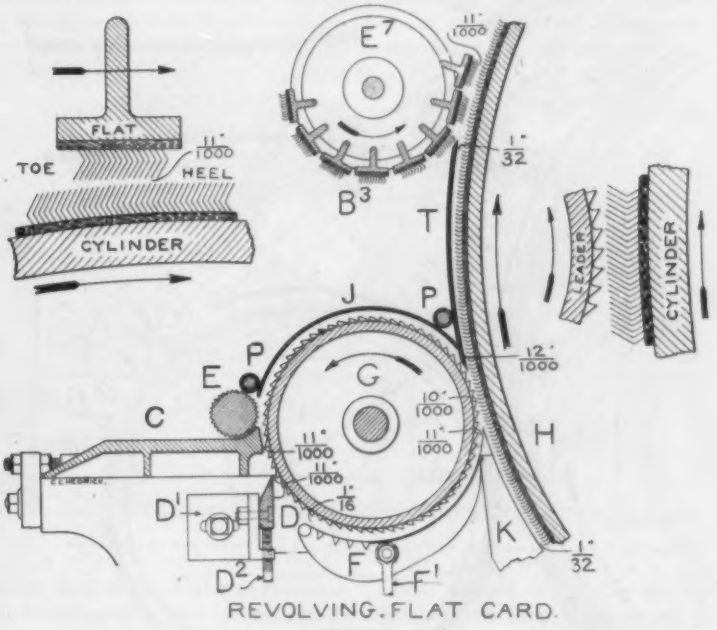


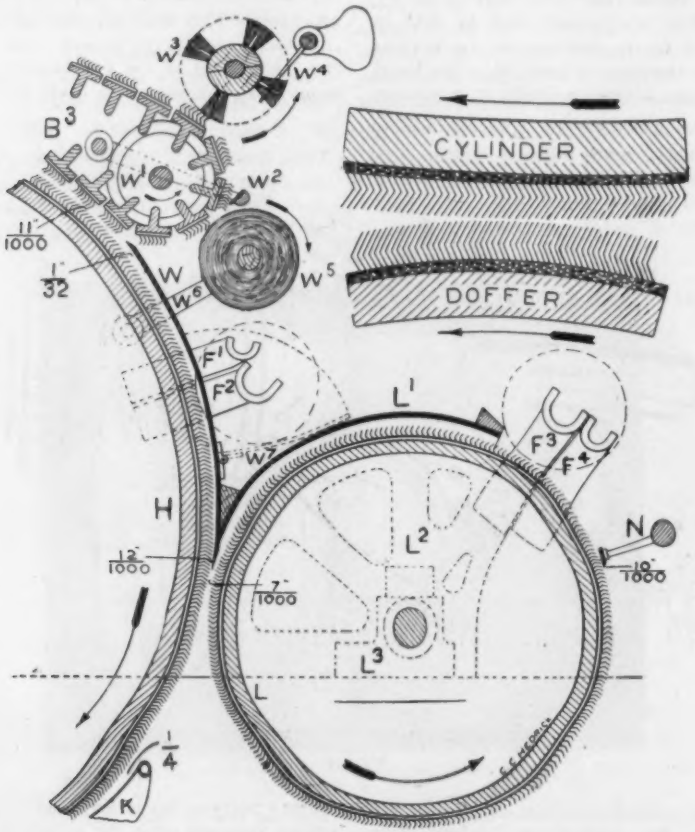
FIG. 44.

under different conditions, are as follows: The distance of the feed plate and the mote knife from the leader, is 11/1000 of an inch. The leader screen is set 11/1000 of an inch from the leader at the point where it is hinged to the cylinder screen. The nose of the screen with which the fibres first come in contact is set from 1/32 to 1/8 of an inch from the leader. This depends upon the condition of the cotton and the amount of fly it is desired to remove. By setting the screen away in this manner, the fibres are gradually drawn into a more compact space and present a more even sheet to the action of the teeth of the cylinder.

When it is required to use the cotton for a very fine grade of work, it is best to remove as much fly as possible at this point rather than to permit it to fall out between the rolls of the drawing frame, or during other processes. This may be done by setting the nose of the screen close to the leader, but if set too close, it is possible to remove much good cotton, thereby making too much waste. The setting depends upon the judgment of the carder. The screen may be adjusted by the rod F^1, the lower end of which passes through a bracket fastened to the side of the card. In setting the leader, from the cylinder, the gauge 10/1000 is generally used. The back plate T, which extends from the leader to the flats, is set about 12/1000 of an inch from the cylinder at its lower edge. At the upper edge, the best results are attained by setting it 1/32 of an inch from the cylinder, this allows the fibres to free

themselves and stand out a little before they meet the flats.

By referring again to Figure 36, it will be seen that the cylinder screen is adjusted at the front part, or nose, by a rod K^2, while at the back, where it joins the leader screen, the vertical adjustment is obtained by a rod K^1, the back and centre, is about 1/32 of an inch from the cylinder, but the front is set away about one-fourth of an inch. This allows the fibres to be gradually drawn between the screen and cylinder. They would be thrown off if the screen were brought close to the cylinder.



REVOLVING FLAT CARD.

FIG. 45.

while the lateral movement is governed by the rod K^3. The centre of the screen is adjusted by the lever K^4, which turns upon a stud K^5. One end of the lever is connected to the screen by a pin K^6, the other end tapped to receive an adjusting screw K^8, which is held between the projecting ears of a stand K^7.

The usual setting of the screen, at

In Figure 45, is shown a partial section through the cylinder, doffer and parts directly connected. The flats B^3 pass around the front block W^1, in the direction shown by the arrow, and the short fibres, or strippings which adhere to them, being removed by the stripping comb W^2. Passing along towards the rear of the card, they are brushed clean by a revolving brush

W^3, called the stripping brush, which is itself cleaned by a stationary comb W^4, called the stripping brush comb. Directly beneath the stripping comb, is the strip roll W^5. This is a wooden roll about 1½ inches in diameter covered with flannel and supported at either end by arms W^6. As the flats pass around the front block, the strippings, which are removed by the comb, are wound upon the roll which revolves by being held lightly in contact with the flats.

It was formerly the custom to allow the strippings to drop upon the doffer cover in a loose mass, and when an amount had collected, it was removed. But with the strip roll, the strippings are wound in a neat and very compact form, which can be removed very quickly, and by reason of this compactness, the removal does not have to be performed so often.

Extending from the flats to the doffer, is a polished steel cover W, called the front or stripping plate. Upon the correct setting of this plate depends the removal of the strippings from the flats. It is usually set at its lower edge about 12/1000 of an inch from the cylinder and about 1/32 of an inch at the top edge. If set close at the top edge, the strippings would be removed from the flats by the cylinder when they reach the edge of the plate, but if it is set away, at the top, they will cling to the flats and be combed off, when they reach the stripping comb.

When it is necessary to grind, or to strip, the cylinder, the door W^7, which is hinged to the front plate, can be turned down as shown by dotted lines.

Over the doffer is a cover L^1, called the doffer bonnet, which is fastened to the doffer shroud L^2, which, in turn, is fastened to the doffer bearing L^3. The doffer is set about 7/1000 of an inch from the cylinder and the doffer comb about 10/1000 of an inch from the doffer.

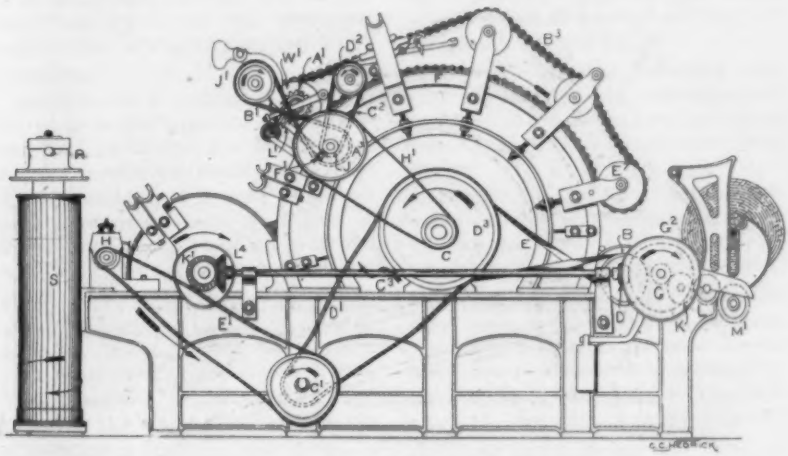


FIG. 46.

The method of driving the various parts of the card will now be considered and illustrated by Figure 46, a side elevation of the right-hand side of a left-hand card, and Figure 47, an elevation, showing the opposite side.

In determining the hand of a card, the custom, followed by most cotton machinery builders in this country, is to face the machine at the delivery, or doffer, end, and whichever side the driving pulley is upon decides whether the card is right or left-hand.

It will be seen in Figure 46 that upon the leader is a pulley, B, which is driven from a large pulley, D^3, that is upon the cylinder shaft, by the

crossed belt, E. The doffer comb is driven from a groove, in this pulley, by the band D^1, which passes to a double grooved carrier pulley, C^1, from which passes another band, E^1, to the comb pulley, H, also double grooved. These last grooves are slightly different in diameter, so that a change in the speed of the doffer comb may be readily made.

The flats, B^2, which pass slowly over the cylinder, in the direction indicated by an arrow, are driven from a sprocket wheel, which is fastened to the inside of the front block, W^1. Motion is communicated to the latter from the small pulley, C, which is upon the cylinder shaft, by the belt, H^1, pulley A^3, worm J, worm gear F^1, worm L^1, and worm gear A^1, the last being upon the front block shaft. The usual speed of the flats is about 3 inches per minute.

The stripping brush is driven from a groove on the inside of the pulley, A^3, by the band, B^1, and the pulley, J^1, while the dandy brush, by which the backs of the flats are brushed clean, before they pass around the front block, is also driven from a small groove on the inside of the pulley, A^3, by the band, C^2, and the pulley, D^2.

The feed roll is driven, from the doffer, by the gears, K^1 and L^4, the side shaft, C^2, and the gears, G^2 and D. The front bearing, for the side shaft, is made so that it may be moved, horizontally, disengaging the gears, K^2 and L^4, when it is desired to stop the feed roll. The lap roll is driven, from the feed roll, by the gears, G, K, L and M^1.

On the opposite side of the card (Figure 47) is the main pulley, A, by which the card is driven.

The doffer is driven from a pulley, Z, which is upon the leader, by the belt, T^1, the barrow pulley, S^1, the pinion, T, and the gear, P^1. Compounded

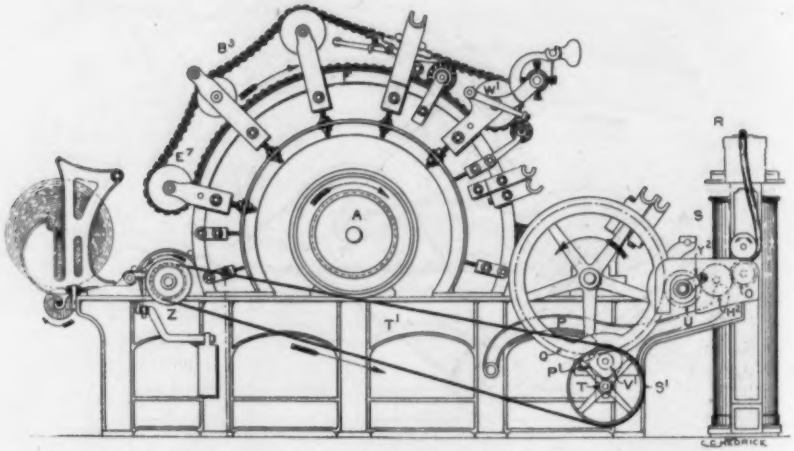


FIG. 47.

with P^1 is a pinion, V^1, which drives the doffer gear, Q. The gears, T, P^1, V^1, and the barrow pulley, S^1, are fixed upon studs, which are carried by a lever, P, called the barrow bar. By this lever, the driving of the feed roll, doffer, calender rolls and coiler is controlled. When it is desired to stop these parts, the lever is dropped which disengages the pinion, V^1, from the gear, Q.

The calender rolls are driven from the doffer gear, Q, by the gears, U, H^2 and O. The gear, U, is called the rifle gear and revolves upon a sleeve, or bushing, which is connected to a handle, Y^2. By turning this handle about one-quarter of a revolution, the rifle

gear is drawn sideways, out of gear with Q, which is necessary, when it is desired to stop the calender rolls and coiler, and still have the doffer turning.

Questions Set by the City and Guilds of London Institute.

Answers by Robert Cunleffe.

Question:—You are assumed to be dealing with a mixing of low middling American and Dhollera cotton, in the proportion of 2 to 1. What proportion of waste would you expect to find (a) at the opener; (b) at the scutchers; (c) below the under-casings at the carding engine, and (d) as strippings?

Answer:—In a mixing, such as referred to in the question, of 2 American to 1 of Indian, the waste under normal conditions would be greater than it would be if it were all American; but under these conditions it ought not to exceed four per cent. We are aware this per cent. is oftentimes greater, but when it is, it is owing either to wilful or careless mixing of sand with cotton. A few years ago a very great outcry was raised in Oldham respecting the amount of sand found in the cotton, the waste made in the opener being as high as seven per cent. Even now, under normal conditions, the four per cent. consists of sand, broken seed, leaf, and so on. So, when we get to the first scutcher, most of the heavy dirt has been taken out, and the per centage should not be more than one and one-half to two per cent.; and in the finishing scutcher, about one to one and one-half per cent. The proportion of waste made at the carding engine from this mixing would be five to six per cent. There are six kinds of waste made at the carding engine: 1st, cylinder strips from cylinder; 2nd, doffer strips from doffer; 3rd, top or flat strips from flats; 4th, roller ends, from ends of cylinder, doffer, rollers and clearers; 5th, fly from under the card on the floor; and 6th, caseily from the under-casings. Now, about two per cent. would come from the flats; two and one-fourth per cent. from strips of cylinder and doffer, and about one and one-fourth per cent. from the under-casings. Of course, the above percentages will vary somewhat under different conditions. If the cotton should have a greater quantity of unripe cotton, the card should be so set as to take this out, and so the percentage will be increased. Again, the card is set to take out a greater percentage of strippings in order to improve the quality of the yarn. If so, this will raise the percentage; but under normal conditions the above will be found an average per cent. at the places referred to.

Question:—Describe generally the mode of spinning the slubbings produced on a condenser carding engine from waste yarn. How are they drawn?

Answer:—In spinning yarn from waste a far different method is adopted than the ordinary method of spinning yarn from ordinary cotton, and, of course, the counts will be of the very coarsest kind, say 1s, or even coarser than that. As the sliver leaves the doffer on a condensing carding engine, it is divided into strips from about 14 to sometimes as many as 100, according to the weight per yard required. After the divided sliver leaves the dividing tapes, they are passed between broad bands of leather, very smooth on their surface, and stretched over rollers, to which a rotative motion is given. Thus the slivers are rubbed up between the leather, and are formed into a roving, and then wound onto bobbins. The bobbins are from 24 to 30 inches long, and from 14 to 30 ends are wound on one bobbin, according to the thickness of the roving being made. These bobbins are put into a creel to be spun on a machine called a billy. These machines are of 300 to 500 spindles long. Now the question asks, how are they drawn? Well, they are not "drawn" at all, speaking in proper technical language, but they are

"stretched." To make this clear we must explain. There are three methods of spinning yarn, or rather of reducing the thick roving in the creel to the proper dimensions of the counts required. First, by stretching, as in the billy; second, by drawing, as in the throstle or ring-frame; third, by combining the two, as in the mule. The throstle has three lines of rollers, each running faster than the preceding. Thus a drawing takes place equal to the difference in surface speed between the front and back lines of rollers. The billy has only one pair of rollers; therefore it cannot draw. The mule combines these two; for whilst it has three pairs of rollers to draw, as in the throstle, it also has the stretching, referred to as "gain," in the mule carriage. Then the method of reducing the thick roving to the required dimension is as follows: When the carriage begins to make its outward run, the rollers begin to revolve, delivering the roving at about the same speed as the carriage is traveling. When the carriage has got about half-way out, or half the distance of the length of the stretch, the rollers are stopped, whilst the carriage continues to move out the remaining length of the stretch; thus stretching the roving, at the same time putting in the twist. Some of our readers may ask, how then are the counts altered if there are no draft rollers? I answer by stopping the rollers a little earlier, thus stretching the roving a little farther, to make it finer, or stopping them a little later to make it coarser.

Question. What are the principal differences between lace and sewing threads? How is each prepared, and what differences exist in the appearance of each when ready for use?

Answer. The principal differences between lace and sewing threads are, first, the threads for lace are finer than those for sewing thread; and second, the threads for lace are more of a golden color, and are not so strong as those for sewing thread. These differences are chiefly owing to the methods of preparing the two different kinds of threads.

The method of preparing the sewing thread is as follows: The yarn is spun on the mule say 50s, 60s, 70s or 80s, according to the counts of the thread required. The yarn is first taken to a winding machine where two cops are wound together on one bobbin, without any twist. These bobbins are then taken to a so-called doubling frame to be twisted. Though these machines are called doubling machines, no doubling takes place here, that being done in the winding machine, and this machine twists the two threads together.

Then these bobbins are taken to another winding machine, where three of these are doubled together, the yarn as a rule passing between or through a clearer. These clearers are pieces of iron or steel with slits or openings. These slits or openings can be regulated wider or closer to suit the different counts being wound. Thus all bad piecings or thick, rough places are prevented going on the bobbin. These bobbins are once more taken to a similar machine to the first one, that is a doubling or twisting machine, only this second twisting must be in the opposite direction to the first. These bobbins are then taken to a reel to be reeled into hanks. These hanks are sometimes 54 inches and sometimes 90 inches in circumference. These hanks are then either bleached or dyed according as the thread is required to be white or colored. It is then polished and wound on spools ready for use. The method of preparing lace thread is, the yarn is taken to a gasing machine where it passes through a flame of gas which burns off all the ooze, or projecting fibres, which gives the yarn a slight golden appearance, and makes it very smooth. After passing through the gasing machine it is wound onto bobbins, two on to one, and then taken to be twisted as in the case of the thread yarn. These bobbins are then taken to a warping machine to be wound onto beams to be

placed behind the lace loom. The sewing thread yarn is required to be very strong, but this factor is not so important for lace. Hence the gasing machine in singing or burning off the ooze on the yarn will make the yarn weaker, whilst glazing or polishing lays all the fibres down, which adds to its strength.

Question. State what you know of the various systems of winding doubled yarn or threads; (1) for twisting; (2) for delivery to the user. Distinguish between them clearly.

Answer. Part of the answer given in the previous question will apply to a certain extent to the first part of this: One system of winding doubled threads for twisting is by a slow traversing winding frame, with large flanged bobbins. At other times, on a very quick traversing winding frame, the bobbins, not having any flanges or heads, simply a tube, these, when wound, are called cheeses. The tubes when empty rest upon drums, which are made to revolve; a steel spindle passing through the tubes and pressed upon by springs. If either or any one (if more than two are being doubled) of the ends break, the bobbin is lifted from the drum and no winding takes place. This is to prevent singles.

These cheeses are much more economical where the yarn has to be sent to some other town; the large flanges adding very materially to the weight, and also increasing the risk of breakage and consequently increased expenditure. So we see that the quick traverse winding on tubes is far more economical than the slow winding and large flanged bobbins. The large flanged bobbins and slow winding are all right for the twisting machine, but the quick traverse and cheeses are better for delivering to the user any distance away.

Question. If you were asked to buy a quantity of cotton for spinning, what properties would you examine it for, and how would you arrive at its relative value? If you paid cash, what terms would you expect to get?

Answer. Any one having the duty of purchasing cotton always has before his mind's eye the object or purpose he wants that cotton to serve. No one being in the coarse spinning trade, say, making yarn up to 32s would ever think of purchasing good Egyptian or Sea Island cotton; and conversely any one wishing to produce good fine yarn, say, 80s or 100s would never think of purchasing low American or Surat. So the first thing is to look for cotton having properties suitable for the yarn required to be produced. Length of staple and fineness of staple being the chief factors.

Having then decided the kind of cotton, that is, whether Sea Island, Egyptian, American or Indian, there are other properties to be noted in any one of them. There are different grades in each class. It requires one well up in handling and examining cotton to detect the difference between one grade and another. Another feature is the color of the cotton. The same shade in color ought to be got as the one you are at present using, otherwise a difficulty would be experienced in mixing and probably striped yarn, which is very objectionable. Another property would be cleanliness. Too much dirt, such as sand, seed, leaf, etc., would cause too much waste and consequently would not be as valuable, other things being equal. Another property would be regularity in staple. Any sample of cotton which shows a great difference in length of staple should be discarded, as it would give an immense amount of trouble and cause a great percentage of waste in passing through the machines. Also its freedom from nep and short, immature fibre.

Another part of the question: How to arrive at its relative value. We first consider the price it is likely we shall get for the yarn. We know, or ought to, how much it will cost per pound to work it. We then have to form an estimate of the loss in waste, etc., and thus we arrive at its relative value.

Regarding the terms of purchase: Cotton is usually bought in Manchester at ten days' credit, less 1½ per cent. discount. If the payment is delayed beyond the ten days allowed, 5 per cent. interest is charged on the amount of the account, and conversely if the account be paid before the expiration of ten days, 5 per cent. interest is allowed, plus ½ per cent. brokerage, and 6d. per bale for forwarding.

Mercerization of Cotton Fabrics.

It is generally considered indispensable to employ, for the production of gloss on cotton fabrics by "mercerization," apparatus specially designed for the purpose. Such apparatus, as a rule, has the disadvantage of being expensive and little productive. According to Smirnoff and Rosenthal, the object can, however, be equally well achieved without special plant, an open soaper and a stenter, as found in all dye or print works, offering all necessary facilities. If the open soaper consists of seven compartments, the first compartment is left empty; the second and third contain boiling dilute caustic soda and carbonate of soda; the two next compartments are fitted with squirt pipes; the sixth compartment is charged with boiling dilute hydrochloric or sulphuric acid; whilst the last one, again, is provided with squirts. Above each compartment is placed a pair of brass and wood squeezing rollers, whilst all guiding rollers are furnished with lapping. The gray singed fabric first becomes impregnated with cold caustic soda of 40° Be., in a small cistern furnished with five guiding rollers; it then passes through a nip formed by a brass and a rubber bowl, and immediately proceeds on its course through the open soaper, the various divisions whereof are utilized in the manner already described. The first empty compartment affords time for the prolonged action of the mercerizing fluid, whilst the rest of the space is devoted to neutralizing and washing. The cloth, as delivered, is ready for dyeing medium and dark shades; whilst for light tints it must first be chemicked. After dyeing, the cloth is dried and simultaneously pulled out to its original width on a suitable stenter; it is then, pure or suitably finished, submitted to hot pressing at a pressure of 250—400 atmospheres. The shrinkage experienced is said to be inconsiderable, and the gloss not inferior to that produced by special machinery.—Farber, Zeitung.

—Although other bleaching agents than chloride of lime, bleaching liquor and powder have from time to time been advocated for the bleaching of cellulose, the use of bleaching powder or liquor—i. e., some form of hypochlorite of lime—is at the present time in general use for cotton goods.

—Spinners often say that they reject all rings not perfectly round. Were this a fact, there would be very little spinning done on ring frames.

—Crum was the principal modern exponent of a mechanical theory of dyeing, and his works published in 1843 and 1846 were almost exclusively confined to cotton dyeing. Crum and his supporters attribute dyeing to an absorption process, similar to the absorption of gases and solids in aqueous solution by charcoal, but this analogy is very imperfect.

—In the standard forms of policies adopted by most states it is stipulated that "All losses shall be estimated according to the true and actual value at the time the same shall happen," and this is taken by our leading underwriters to mean the cost of replacing the property with a credit for a just and fair amount for depreciation for the use already had of it, and this without regard to what the property may have cost five, ten or twenty years before, or whether a building after modern methods could be made to cover the machinery for less or more than one like that burned.

WOOLEN DEPARTMENT.

Ingenuity in Modern Textiles.

CHARLES E. WILES.

ARTICLE IV. (Continued).

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A ten heald production which has probably been derived from a simple twilled weave by taking the threads in pairs is given at Figure 1, and serves to show in some degree the possibility of obtaining altogether new styles from others by a systematic rearrangement of the threads or picks composing them. The effect of this weave as seen in the finished fabric is extremely neat, showing a broken twill, and the required particulars for reproducing it are as follows:

Warp:
2/50s Worsted—all black.
17s reed 6s.
Weft:
Same as warp.
102 threads and 90 picks per inch.

An eight-shaft weave of a somewhat similar description is also illustrated, Figure 2. This assumes a twilled appearance when woven and might be produced in a 2/48s dark gray warp, 16s reed, 6 threads in a dent. The weft to be the same, 96 threads and picks on the inch.

Figure 3, which is complete on twelve shafts, is an effective combination of warp and weft cord, but additional interest was given to it in the woven sample by means of using weft yarns of different sizes as particularized here:

Warp:
All 2/50s Worsted—black.
20s reed 6s.
Weft:
2 picks of 2/50s Worsted—black.
1 pick of 2/20s Worsted—black.
120 threads and 115 picks per inch.

It will be seen that the thicker weft (2/20s) comes on the surface only in those places where the warp is working three up, three down, and this it is which, to a large extent, is responsible for the novel appearance the cloth possesses.

One feature regarding cloths woven from crossings like Numbers 1, 2 and 3, and one which is looked upon as of paramount importance by many manufacturers, is the comparative lightness inseparable from them. Where a cloth sells by weight, these makes will not do, and some remedy has to be found to supply the lacking weight. This results in a back of some sort being added to the texture, the yarns thus employed being, for cheapness' sake, often of a very inferior nature. This weight-imparting operation may take one of three forms; the back may be composed of warp yarns only, that is, the texture may be made a double one, warp ways, this being done in the majority of instances. It may be single in the warp and have an increased supply of weft yarn for the back; or, thirdly, two complete series of extra threads may be added, making what is termed a double cloth.

As will be seen from the accompanying designs, Numbers 4, 5 and 6, which exemplify the first method referred to, practically any type of crossing may be so treated. The warp in Numbers 4 and 6 has been arranged two of face yarn to one of back, and in No. 5 one of each alternately; the scheme of their construction has been rendered more clearly apparent by the two kinds of marks which have been made use of to distinguish face and back threads respectively. The face weaves employed for each of these designs are given in conjunction with them, being lettered 4A, 5A and 6A respectively, and instructions for making these fabrics in the loom are as follows:

PLAN 4.

Warp:
1 thread of 2/32s Worsted—dark blue.
1 thread of 2/22s Worsted—dark blue.
1 thread of 2/32s Worsted—dark blue.
17s reed 6s.
Weft:
All 2/32s Worsted—dark blue.
102 threads and 66 picks per inch.

PLAN 5.

Warp:
1 thread of 2/48s Worsted—dark gray shade.
1 thread of 2/42s Worsted—dark gray shade.
(Order of coloring to commence on a face thread.)
25s reed 6s.
Weft:
All 2/48s Worsted—dark gray shade.
150 threads and 80 picks per inch.

PLAN 6.

Warp:
All 2/24s Worsted—black.
Reed—13½ dents per inch, 6 threads in a dent.
Weft:
Same as warp.
81 threads and 70 picks per inch.

The colorings suggested in all the foregoing examples have been solid, giving as a rule cloths in which the qualities of neatness and quietness are desired. Such qualities have at least one advantage to recommend them, for an unobtrusively toned cloth is more economical in wear by reason of its being less easily tired of than one of more striking pattern. Nevertheless, if we extend our criticisms to suiting as well as coating styles, a great many variations in coloring and checking are at once discernible. A typical example could be produced from weave 5, this being the ordinary two and two twill backed with warp, a highly useful crossing in which to procure colored effects. This might be warped and woven as follows:

Warp:
1 thread of 2/48s Worsted—chocolate brown shade. } for 12
1 thread of 2/42s Worsted—chocolate brown shade. } threads.
1 thread 2/48s Worsted—white. } for 12
1 thread 2/42s Worsted—white. } threads.
25s reed 6s.
Weft:
6 picks of 2/48s Worsted—chocolate brown shade.
6 picks of 2/48s Worsted—white.
150 threads and 80 picks per inch.

giving a checked effect medium in size and smart in wear.

The texture of which a photographic reproduction is given in Figure 7, furnishes another example of weave and color combination in worsted yarns. The weave employed is simple in character (see Figure 7A) being complete on ten threads and six picks, and these numbers have been adhered to in arranging the order for warp and weft colors, i. e., the threads run ten of one shade and ten of another, assuming the positions indicated on the plan; at the same time the picks are inserted six of one shade and six of the other, their positions also being shown. For the purpose of retaining the necessary "squareness" in the small, star-like effects, the warp yarns have been rankly set and slight increase made in the thickness of those used for weft. Full weaving particulars are here given:

Warp:
10 threads of 2/60s Worsted—dark gray shade.
10 threads of 2/60s Worsted—light gray shade.
23s reed 5s.
Weft:
6 picks of 2/48s Worsted—dark gray shade.
6 picks of 2/48s Worsted—light gray shade.
115 threads and 72 picks per inch.

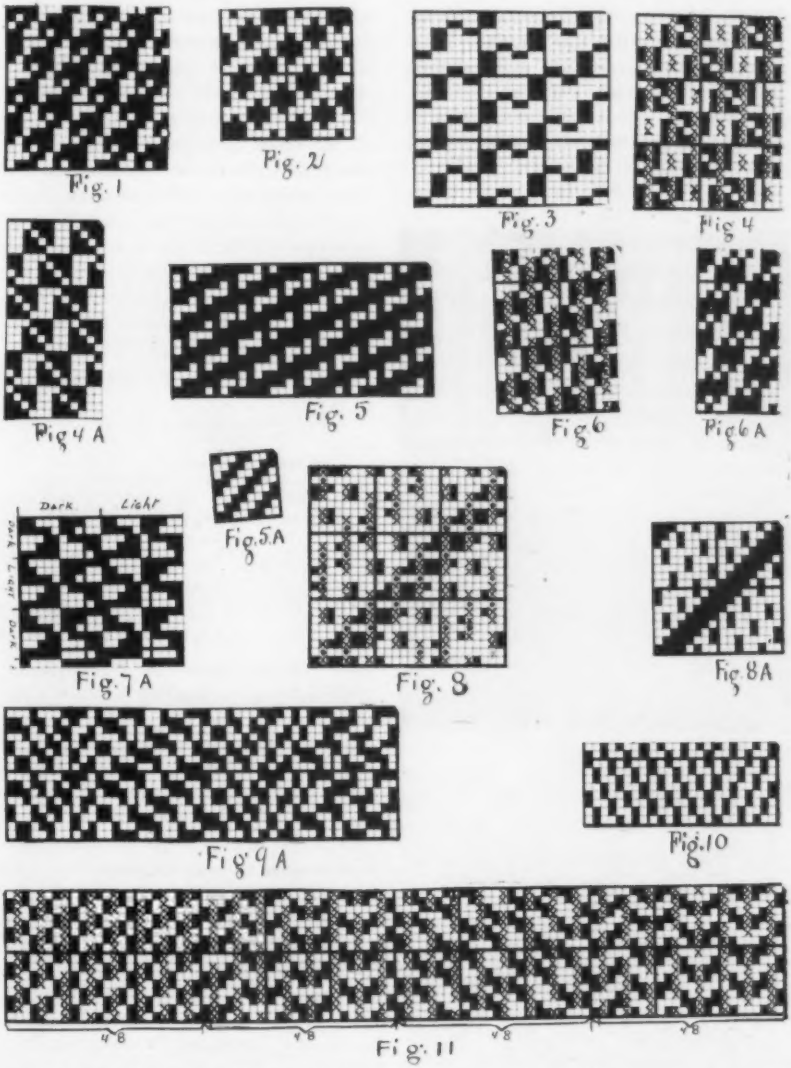
Backing by means of the weft yarns is only very sparingly practised now, suffice it is to say that the method employed for accomplishing this is closely similar to warp backing, of which examples have already been seen. But as no reference has been made as yet to the double cloth arrangement, an illustration of this is presented in Figure 8.

The method of building up this weave, which is designed for a fabric having two threads and picks of face yarn to one thread and pick of backing, has been as far as possible preserved, so that no difficulty need be experienced in arriving at its operation. Those squares which are filled in solid, mark the crossings for the surface texture, of which a separate plan is given in Figure 8A. The dots belong to the back cloth and interlace in four shaft twill order, and the crosses signify the sinking of the backing warp under the face weft.

WEAVING PARTICULARS.

Warp:
1 thread of 2/48s Worsted—dark shade.
1 thread of 2/28s Worsted—dark shade.
1 thread of 2/48s Worsted—dark shade.
24s reed 6s.
Weft:
Same as warp.
144 threads and 120 picks per inch.

Trouserings.—The ingenuity displayed both in the selection of weaves and also in the combination of them to the maximum degree of advantage with suitable color schemes, is naturally of a more extensive character than is found to be the case with the coatings and suitings, the latter goods not lending themselves so profitably to the various interesting devices employed.



An inspection of the best productions appertaining to this branch of the industry and emanating from the leading English and Continental mills, with a view of deciding upon the makers of those goods which bore the greatest merit as regards pure ingenuity of construction, seems to result in French manufacturers being the ones selected.

The science evident in many of their designs betokens on the part of their creators such a knowledge of the pos-

sibilities in cloth fabrication as occurs with a less marked frequency elsewhere. There are, of course, some features in connection with these French efforts which render them to a greater or less extent unfitted for English markets. For example, the colors in many cases are too delicate and are therefore out of place in a country the atmospheric and meteorological phenomena of which have been assiduously denounced as "all samples." There is also a conspicuous

FIG. 7.

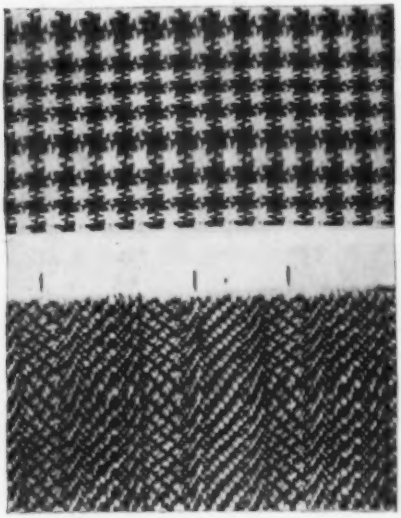


FIG. 9.

effect produced by employing stripes of inordinate width in a pattern, and this when intensified, as it often is, by a striking contrast of weave or color visible in adjacent sections of the design, becomes altogether inappropriate when removed to different surroundings. But in spite of all this, a good deal may be learnt from such productions, and amongst the accompanying designs one or two of these structures will be illustrated.

The pleasing variety of effect exhibited in Figure 9 is due solely to a combination of weaves, the warp of the cloth from which the photograph is taken being all white and the weft black. The woven appearance of the complete plan, which latter is given in Figure 9A, is slightly modified in some patterns of the range by the introduction of fancy twist yarns in the warp and also of threads of white silk. The position of the silk threads is indicated in the reproduction of the pattern at Figure 9, and the twist yarns occur every third thread in suitable parts of the pattern, not more than six or seven forming a group at any one place. The most judicious placing of such yarns in a pattern is generally at the junctions of the weaves, as by so arranging them the joining is to an appreciable extent hidden. Plan 9A, as will be seen, is composed of two forms of the Mayo weave in conjunction with derivatives of a simple twill. Particulars for weaving:

Warp:
2/36s Worsted (loosely twisted)—all white.
16s reed 4s.
Weft:
2/36s Worsted—all black.
64 threads and 70 picks per inch.

The silk should be white—2/40s, spun trebled, and the twist thread 2/36s brown and white.

A specimen of weave and color stripe combination may next receive attention, as it furnishes an example of the possibilities of this kind of design in single textures. The weaving plan is made by angling what is commonly called the five shaft Venetian crossing, fifteen threads twilling in one direction and nine the opposite way. The yarn arrangement is as follows:

Warp:
3 threads of 2/48s Worsted—medium lavender shade. } for 15
3 threads of 2/36s Worsted—dark slate shade } threads.
1 thread of 2/48s Worsted—medium gray shade. } for 9
1 thread of 2/36s Worsted—dark gray shade. } threads.
20s reed 4s.
Weft:
1 pick of 2/48s Worsted—black.
1 pick of 2/36s Worsted—black.
80 threads and picks per inch.
Shrinkage 3% and clear finish.

As was the case with coating cloths, similarly the first principle of adding weight in trousering makes is by supplementing the ordinary series of threads with a second series warp

ways, this being exemplified in Design 11, which, for practical purposes, should be enlarged as directed by the numbers underneath to 192 threads, the face stripe being composed of three varieties of weave.

The chief rule to be observed in providing orders of coloring for a plan of this kind, is to select such numbers of each color or shade as correspond in some way with the weaves in the different sections, taking care that the whole arrangement is of a nature to balance properly when repetitions of it are viewed. The preparation here for weaving would be as follows:

Warp:
1 thread of 2/48s Worsted for face.
1 thread of 2/28s Worsted for back.
1 thread of 2/48s Worsted for face.
24s reed 6s.

Weft:
All 2/48s Worsted.
144 threads and 96 picks per inch.

The face colors being distributed thus:

12 threads (medium brown shade).
2 threads (dark brown shade).
25 threads (medium brown shade).
2 threads of another shade (A).
25 threads (medium brown shade).
2 threads (dark brown shade).
20 threads (medium brown shade).
2 threads (like A).
13 threads (medium brown shade).
2 threads (dark brown shade).
13 threads (medium brown shade).
2 threads (shade A).
8 threads (medium brown shade).

backing warp to be all medium brown with dark brown for weft.

Some Causes of Defects in Textiles.

Abstract of a lecture delivered at the Technical Schools, Shipley, England, by Albert M. Chapman.

(Continued from January.)

In blending for worsted yarns, the balls of tops are mixed by running them through a series of gill boxes, the number of ends put up at the back of the first box being regulated entirely by the proportionate quantity of each material or shade necessary to produce the desired blend. From this, I think, it will be readily understood that if one of the ends should break, and the machine go on running without its being seen, that part will be short of the color or material which has broken, and will produce a slightly different sliver, and unless rectified, will give later a spun thread different from the bulk. This is one of the causes of shady places across the piece, having rather the appearance of a wrong bobbin of weft. Streaky colored mixtures are often caused by not putting the material through a sufficient number of operations to ensure the colors being evenly mixed.

The use of cheap and bad qualities of oil for working up the wool cannot be too strongly deprecated. We sometimes see wonderful compounds advertised at a much lower rate than good oil, but it is not cheap if it injures the fibre. It is found that many of them soon turn rancid and sticky on the wool and yarn, and do not readily lose their hold on it—as the dyer finds to his cost when he cannot get the piece scoured clean—producing streaky and cloudy pieces. For worsted yarns experience proves there is nothing better than a good olive oil, amongst which, we may say, Gallipoli is one of the best. It pays better in the end than these cheap compounds, which are largely mineral oils. For woolen yarns oleine oil is largely used; by the addition of an alkali in the scouring liquor, it produces a soap which will scour the piece clean, but an important point is to see the oil is free from any trace of sulphuric acid.

Defects in worsted yarns can sometimes be traced from the combing. The object of the process is to comb out and straighten the fibres and remove all immature and short fibres below a certain length. To do this it is important that every part of the wool be combed and the noil cleared out; if not, it is seen later in the roving and spun thread. Further, in the combing we have it in our power to take out, or leave in, as much of the short wool as we desire; the more we take out, the more equal in length the fibres will be which are left, giving an even and smooth thread as compared with the one where a fair amount of the short has been left in. In colored worsted yarns, we occasionally see very thick places or "slubs," which.

in fine dress goods, suitings, or trouserings, are altogether fatal, making it impossible to produce perfect goods with such yarns. The cause explains itself when we find that the slubbing or top has not been re-combed on coming from the dyer. On examining the slubbing we find the outside of it has been distributed or roughed up, and some parts are a little fast or matted. This should all be put right by re-combing before it is passed on to the drawing. It is false economy to try and save the cost of re-combing for such yarns.

In the drawing, defects generally arise from defective fallers, rollers, etc., or by reason of hurrying the work by reducing the number of operations or doublings and using excessive drafts, thereby laying the groundwork of a thread which will be uneven when spun.

What are known as "weft rows" show in the finished cloth as bars across the piece, giving a well-defined line just where a bobbin of weft begins and finishes. It is often a difficult matter to see them previous to dyeing, but afterwards they are clear enough, appearing rather duller or deeper, and leading one to think at the first glance that it is another quality of material. It may be exactly the same quality and counts of yarn, but appearing just a little fuller or rougher—just a fraction, which is sufficient to show when finished. One of the chief causes of the fault is a slight variation in twist caused by spinning with slack bands. It may be done by weaving together in the same piece hard and soft bobbins, or by not dragging the weft exactly the same in the weaver's shuttle, as in the case of having one shuttle with a brush in it to drag the weft and another without; but this will rarely happen, as other complications would prevent a weaver doing so for long.

An even thread is one of the things of utmost importance in the majority of worsted yarns. Especially is this so in regard to fabrics which have a large quantity of warp on the surface, such as corkscrews, venetians, whipcords, sateens, covert coatings, etc., and which have the surface cropped clean in the finishing of all loose or short fibres and exposing very clearly any unevenness in the thickness of the yarn. To produce a good double twist yarn for either warp or weft the single yarn must be evenly spun. Though in the doubling one thread partly covers another, it cannot hide unevenness sufficiently to do for goods which show faults up so clearly as those mentioned. In addition to unevenness, the chief faults in doubled yarns are: single yarn caused by one end breaking, slack or tight twist, snarls, etc.

We must now turn our attention to the first of the processes of preparation for the loom, viz., Warping. The chief causes of defects starting with this process are varying tensions of thread, mixing of old, new, or rewound yarn, and sometimes by running the vertical warping mill both ways. One very fruitful source of defects is the mixing together of various lots of yarn. It will very often happen that having made a warp from a certain class of yarn, a small quantity will be left, which it is desired to use up with the next lot of the same class of material which may be made. To do this with safety requires very good judgment indeed. Two lots of yarn may be made from the same lot of wool and treated in exactly the same way in the machinery, but put through at separate times produces a defect when placed together in the form of distinct stripes in the direction of the warp. Especially is this so in regard to piece dyed goods. A yarn which has been newly spun is in a much different condition to one which has been in stock some time; it is all alive, and will curl up much more readily when the stretch on it is released than one which has been in stock awhile and got set. If it is decided to mix various yarns together, everything possible should be done to spread them

equally across the width, and by mixing thoroughly, minimize as much as possible the risk of them showing stripes. To do this it is necessary to arrange the bobbins in a certain order on the warping creel—not in vertical but transverse rows. Say the yarn will run three of new to one of old, then arrange the rows of bobbins in that order and so spread the yarn across the warp. Never put one sort of yarn all together down one side of the creel, as if this is done, the yarn will come down one side of the woven piece and is nearly certain to show when dyed and finished.

One other cause is often overlooked, i. e., the fact that in a worsted frame spun yarn the tendency is for the fibres to all point in one direction because of the way they have been drafted, and the direction in which the twist is put in afterwards. For various reasons bobbins are often rewound. If this is only done once the fibres are turned in the opposite direction, and when mixed with threads which have not been rewound, give quite a different appearance in the finished cloth, simply because the treatment in both the weaving and finishing has a different effect on both types of thread: in one case smoothing or further laying the fibres, in the other roughing or opposing their direction, and so a shady character is assumed in stripe form. By rewinding a second time you bring the fibres back into their original position so that they can be mixed with safety. Working the vertical warping mill both ways has a very similar effect, but giving stripes equal to the number of bobbins they are being used for warping form. What is meant by working both ways is illustrated by starting the warp at the bottom of the mill and gradually filling it towards the top until the length is got on. If you now work downwards the mill must run the other way round to wind on the warp, and in so doing the lay of the fibres will be in the opposite direction. In worsted yarns the mill should always run one way, which necessitates cutting off at the top and bringing the heck-box to the bottom every time to start each succeeding set of threads necessary to complete the warp.

Inequality of tension in the warp threads occasionally causes defects in the form of tight or slack ends in the woven pieces. This is very difficult to remedy after having once left the warping mill. One of the causes is to be found in the varying drag of the bobbin placed in the creel, which is very well illustrated by watching the action of full and nearly empty bobbins in the warping. It will be seen that the threads on the almost empty bobbins have much more drag on them than those which are full, because being less in circumference the bobbin must be dragged round much oftener to keep up with the other, and once started, has rather a tendency to over-run itself.

Warp dressing or beaming is the next important step in the preparation of the warp for weaving. The object of the process is to place all the warp threads straight side by side at a regular tension and mix the various sections so that any inequalities of condition, twist, color, or tension, may be distributed evenly across the width of the warp, and thus not be so liable to show up the defects. It is a very important process, and unless done properly it becomes impossible to produce a smart piece in the weaving. Warps are made generally for plain work, i. e., all one color, in either two or four balls or sections, and the manner of placing them together on the warp beam depends to a large extent upon the class of goods they have to make. For very low goods the warp is placed into the raddle and run on to the beam at one operation, but though this may do for low woolens, more care is generally necessary in worsteds. In the first place it is a very unwise proceeding to wind on the two sections of a warp side by side. They should be mixed with each

other in the reed, and then if there is any difference in the condition of these sections it is spread across.

For goods of a low or rough description winding on to the beam direct out of the ball, after slaying them in the reed end and end from the two balls of warp, gives a beam or warp even enough for the purpose; but for a large quantity of dress goods, coatings, and trouserings, it is necessary to put in more work to ensure the threads being straight and regular in tension. For example, a large quantity of worsted warps are treated in the following way: The warp is made in four balls or sections, two of these are slayed in the reed end and end with each other and wound on to the beam, the next two balls are then put up and slayed end and end with the warp on the beam, thus giving four threads in each dent of the reed, which is then wound on to the beam for weaving.

Another method adopted for very fine goods, especially those which show a fair amount of warp on the surface, is to take two sections, and after slaying them end and end with each other wind them on to a beam. The next two sections are dealt with in exactly the same way. Then the two beams are placed together and their warps slayed end and end with each other and wound on to the weaving beam, thus giving a thorough mixing, and by running three times gives every opportunity for taking out any slack or uneven threads. Defects may be caused by insufficient mixing producing stripes or unevenness in the piece; by crossing ends, causing them to be dragging out of their proper place and creating tight places; or by irregular tension on the warps as they are being wound on to the beams, which is a very important matter and may give much trouble if not attended to. It is usual to keep checking, as well as handling, the various sections to see that one is of the same tension as the other, a further check taking place as the cut marks on the warps come in. It is also of importance to see that the warp is beamed exactly at the proper width, and that the selvages are no higher or lower than the bulk of the warp, or slack and tight selvages result.

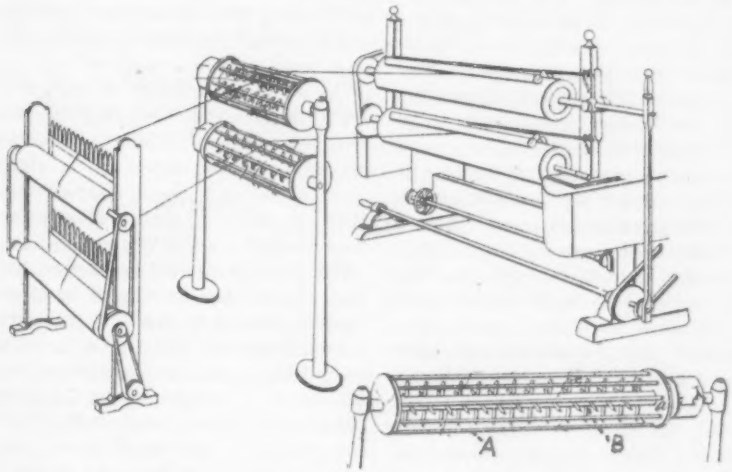
I might here quote an example of irregular tension in the warp which I have seen occur several times by carelessness in tying down the warp to the beam. Instead of making a series of small knots and turning them so as not to project very much, the warp was gathered up into a few large knots, causing the circumference of the warp on the beam to be greater where the knot was, and consequently the strain or drag on the warp to be greater at some places than others. The strain is greatest when the knot is furthest away from the piece in weaving, and least when in the opposite position. This results in distinct marks where the knot comes, which gradually shades away until the knot comes round again. I have seen goods which were so badly cockled that you could imagine the knot was placed underneath, the fault becoming worse in the piece the nearer you get to the knot; so if a warp was made ten pieces in length it might not be seen until in the ninth piece, and gradually get worse until the warp is all woven up.

(To be continued.)

Electricity in Wool.

As noted by the inquiries that we have received and published in previous issues, for the best methods of overcoming the trouble arising from electricity in wool, much interest is at the present time taken in this subject, as is usually the case in winter. We have answered these inquiries fully, but it may be of a little interest to our many readers to know that carders have been endeavoring for a good many years past to invent devices to convey the electricity away from the roving as it passes from the finisher carding machine to the spool.

We have recently come across a device or reel, that was in operation as long ago as 1850, which we illustrate herewith, not only for the purpose of showing the contrivance, but calling attention to the means that were then in vogue for condensing the roving and the simple mechanical arrangement by which it was accomplished. The illustration will be readily understood without any detailed allusion to it by us. The means of oscillating the rub rolls was something that any tyro of a mechanic could have done. Some of the old carders will remember the rattling mechanism like the illustration.



Turning to the electrical contrivance, we will say that it was a method of preventing the divergence of the fibres of wool by electricity, without the employment of oil for that purpose. Before means of this kind were used, large quantities of oil were put on the wool to counteract the effect of electricity. One of the bad consequences arising from such a free use of oil was the large amount of alkali that was required to remove the oil in the finishing of the goods. The reel consisted of suitable conductors, A, arranged as seen in the illustration. Pointed spines B, projected from the central shaft, the latter terminating at each extremity in journals supported on metallic standards to convey the electricity to the ground. The electrical reel revolved by means of a belt, at a slow speed.

—Sheep shearing in colonial days was mostly done by men, though the women, used to all hardships, helped to catch and hold the sheep. After the shearing the fleeces were picked, the first and best quality of wool being known as pick-locks. After picking, the wool was washed again; then the burrs, which became fastened to the sheep while grazing, were carefully taken out, and after repeated washings in warm alkaline solution, the wool became dry and hard, after which it was thoroughly oiled before being carded. The carding required much skill, and was delicate work, suited to women's fingers, and the worker had always a small fire near her to keep the carder hot.

—In dyeing with the adjective dyes, the mordant is first dissolved in the fibre, and then fixes the color within the fibre by combining with it.

—When cotton is bleached it only loses about 7 ½ per cent. of its weight, whereas linen loses about 35 per cent. Pure cotton is "cellulose," and linen is "lignine," which are very much the same.

KNITTING DEPARTMENT.

The Knit Goods Situation.

Business in knit goods the first three weeks in January, 1899, has averaged about 20 per cent. greater than in the corresponding period of 1898, if the statement of three representative New York houses holds good throughout the trade. As these concerns have a sizable patronage west of Chicago, as well as in the East, their testimony cannot be considered sectional. Furthermore, collections are coming in earlier and in larger installments than for several years, showing that holiday trade was extremely satisfactory. There is a marked tone of confidence which betokens a big year's business, and while preparations among jobbers are being conservatively made, they are upon a decidedly rising scale.

The beneficial effects of last summer's intense heat are being felt, alongside the seasonable demand brought into play by the exceptionally low temperatures of the last two months. This comes in the form of duplicate light weight orders on spring and summer lines. The roast of September cleared out about everything in stock that August had not exhausted, to say nothing of the mild, protracted fall that bore upon middle weights. These duplications bid fair to increase, rather than decrease, for several weeks to come. As has before been intimated in this department of The Textile World, it is legitimate, seasonable demands rather than speculative activity, that is mainly responsible for the impetus in the trade. England is experiencing high temperatures, however, and the consequent suffering of manufacturers is by no means confined to heavy goods.

German advices are fairly assuring, prices being well sustained. Lace hosiery is about the only line, however, that Chemnitz is likely to be behind on. Ingrain lisles and light colored grounds in fancies are especially in request.

In domestic hosiery, ribbed goods and combinations with embroidery, will divide the field with openwork effects. Printed styles show so much improvement it is reasonable to suppose that they will steadily forge ahead. If the seamless business was in anything like the satisfactory condition of full fashioned, congratulations would be in order. It will not be until there is a let up in low grade productions, which, requiring comparatively incomplete plants, have served to invite the competition of a small army of minnow manufacturers. The shape of many of the seamless goods shown could scarcely be worse.

The reaction against nightmare fancies is seen day by day to have extended into golf lines, with even greater potency. The reason is easily to be found. Golf goods outwear several pairs of ordinary hosiery, besides being much more conspicuous. Plaids for children, in the better ribbed qualities, are still plentiful, with prospect of being in steady request.

In underwear, most of the traveling salesmen are already in motion for fall business, which promises, like almost everything else, to open early this year. Importers have had their lines of Swiss ribbed goods for fall importation out several weeks, their business being improved by the same factors that have helped domestic lines. The introduction of various novelties in fancies has relieved staples appreciably and ought to be pressed still further, instead of attempting to force old lines.

Something of the old tendency to anticipate the season is noticeable and the experience will be as dearly bought as usual. Indeed, some early business has already been placed at

cut prices that would have taken care of themselves had a little more time been allowed.

Fancy balbriggans are sure to be in high favor. Jerseys are increasingly in call, their stretching quality being such that small dealers are not obliged to carry as many sizes in stock. While there has been a steady flow of small orders, it is evident that the jobbing trade has not been called upon for anything like the running demand since the middle of December. Dealers have been working off old stock until their shelves are comparatively bare. Not even exceptionally mild weather until March can prevent this vacuum from being felt, and middlemen must profit accordingly.

There have been fully as many January changes, this year, in both departments of the knit goods trade, as usual.

From Chemnitz.

Editor Textile World:

In the hosiery line, there is so little to add to what was sent in my last letter that it is hardly worth writing. Repeats, so pleasant to manufacturers here, are to me abominable, and yet I can do nothing else. At times I am tempted to vary the dull monotony by reversing the order of arrangement, by beginning one week with hosiery the next with gloves and the next with underwear. Even this, like Beaufort's eight guards in Dumas' "Twenty Years After," would wind up by being as monotonous as most of what I have sent during the last six months. One thing will interest you and that is the efforts being made here to force the metric system into international use among spinners and weavers of yarn. It is time for us, and for England, to take this question of measurement seriously. Reports reached me this morning, from St. Petersburg, that Russia is about to open industrial, industrial art and technical schools. Plans have been submitted for a Technical Chemical Trade School; also for one to aid exporters. Who has the schools, has the future.

The hosiery story is an easily told tale. Woolens are being worked off this and last week. Shipments are going as fast as shippers can handle them. All week the wires were warm between here, London, Paris and New York in regard to goods going out unmarked. The custom has been to put "Made in Germany" on box or bag; now it seems necessary, according to recent instructions, to put it on each separate pair. You can understand the cabling and consequent confusion when I tell you that half a dozen big houses had boxes in the hands of shippers ready for delivery to Hamburg, Bremen, etc. The run is still in Richelieus, Rembrandts, ribbed, etc., in blacks, and blacks with white rings, striped and white heels and toes. Nice ingrains are always in demand. Sales of fancies are few and far between. Prevailing prices are fair; in some cases high. Half a dozen of what one big manufacturer called "dumb phool factors" are running prices by running after buyers asking them to name prices. England, Canada and the East still come; America, however, is still regarded as the best buyer. I know of nothing particularly new. Rumors are running round that one or two changes are soon to take place in one or two quite large concerns. On that date, Mr. Frost, well and favorably known to the trade, goes up to the head of the Nottingham company here. Frost is one of the best men in the hosiery line here or anywhere. His word is as good as gold, and he knows hose and knit goods from the ground up.

The situation for gloves remains the same. It is impossible to fill orders, for button gloves on time. The help are not on hand. It seems too bad; but it cannot be helped, nor is the contingency one that could have been foreseen. Had anyone asked my opinion as to the possibilities of the glove trade six or eight months ago I would

have said, they are poor as the historical church mice or Job's turkey. Everything, anything with buttons, no matter how worthless will be bought. If anyone can tell me why button gloves should go as now against elastic or band gloves I would like to have him do so.

In underwear the work goes merrily on, everybody is busy. It is not surprising, however, when one measures the goods against the money paid for them. We are having warm weather, and have had it for a long time. This was disastrous to many. Repeats don't repeat. Everybody is busy building up their piles of summer goods. Most of them are fine lisles, silks and half silks.

BROWN.

Chemnitz, Saxony.

Hosiery Machinery.

Editor Textile World:

In one of your recent issues, an inquiry appeared concerning automatic and semi-automatic hosiery machinery.

Among the new processes and inventions in the manufacturing of hosiery, the circular automatic hosiery knitting machine has undergone a wonderful change in the past few years, and more especially in the past two years, during which many improvements and patents have been issued. The hosiery frame first known by me was one made by Walter Aiken of Laconia, N. H., in 1860 or '61, for the special purpose of making woolen socks, or a garment for the foot, like the foot of a stocking, or the shoe of the ancient actors of comedy. This frame had the latch needle, which was very costly at that period, costing from fifty to sixty dollars per thousand. In the Watervliet mills in Cohoes, where I was then working, we had a large number of these machines, also Aiken's flat heeling machines. The toe was knit on by hand. The yarn for toeing was white and coarse, while the body of the socks was coarse sheep's gray, making a beautiful contrast. The late Civil War had begun, and the proprietors of the mill received a very large army and navy contract, which kept the machinery running night and day for many months. The goods were afterwards made for the general trade. They were honestly made and kept up to standard. The web was of continuous size and length, cut afterwards to the required lengths, and then weighed in dozen lots. There was no welt or rib on the top of the socks, and this had to be done by hand chain stitch to keep them from raveling. The heel was knit the required width, cut in lengths like a gusset, and set in by hand. The web was cut half way through for this purpose, and the knitting being of a plain stitch, was easily taken up. The toe and heel were inserted as diagrams will show.

No. 1. Web as knit. Cut at "a" for heel.

No. 2. Web as knit with heel set in and toe knit. Not washed.

No. 3. Washed, and on the form.

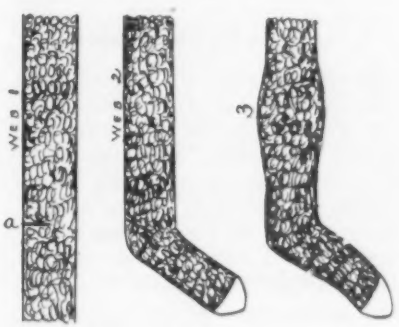
When taken off the forms, the socks appear as in the diagram, presenting all the qualifications of an A1 article, as in reality it is a seamless or fashioned sock.

But the automatic hosiery machines of the present day will make a hose with a heel pocket, knit in at the proper place, and the toe properly cut, looped, overseamed or sewed. Also a ribbed top, looped, sewed or overseamed put on, as required, for the class of goods made. For high priced goods, it is necessary to loop them, making what is termed fashioned goods, or seamless socks. But the latest improved automatic knitters have many special advantages, such as a cam ring made in sections, which can be replaced in a few minutes, permitting broken or defective needles to be speedily located and easily removed. With the automatic stop motions and quarter savers, there is very little excuse for bad work.

The automatic machines have so far advanced the process of knitting that

almost any person who may ask for a place in a knitting room is hired to run the machine. I remember when knitting was more of a fine art, when none but experienced help was had to run them; when the old hand frame knitters thought so much of their machines that they would not allow any one to tamper with them. If it were necessary for these knitters to be so particular, how much more is it desirable that the utmost care should be exercised by the knitters of today. Of all the old hand frame knitters I knew nearly 50 years ago, only one is alive, John Maxwell, manager of the Wilton Hygiene Underwear Knitting Co., Philadelphia.

Automatic machines have been improved so much of late that fancy hosiery of nearly every description can be manufactured on them. A foreign exchange says that some large dealers expect next spring a greater demand for this class of goods, and for some time to come; so it might be well for our manufacturers to experiment a little on novelties; for our ingenious knitting machine makers have skilfully introduced attachments for getting much more from ordinary knitting frames than was originally intended. Making intricate blocks and figured designs on a modern knitting machine, fitted with all the Jacquard attachments, is not very difficult, but to work off this nature on the old style machine, with cut pressers and similar devices, is more difficult.



OLD SUPERINTENDENT.

Improving the Standard.

American inventive genius, has, of late, wrought marvellous improvements in mechanism, speed, and artistic effect on power knitting machines. We are manufacturing nearly every article in the line of knitted fabrics that is made in Europe; our goods being classed fully equal to the foreign product, and some styles accorded even a higher standard of excellence.

The knitting industry in this country has grown to immense proportions of late. When I first knew it, there were only ten sets of power knitting machines in this country, and I set up the eleventh. What constitutes a set is one first and second breaker and finisher card, forty or more inches wide with spinning for the same. According to carding surface as now usually reckoned, five sets forty-eight inches wide, which width I prefer for all practical purposes, would make a six set mill of twenty years ago.

To show your readers the rapid increase, I would refer to your journal of September, 1895, when the number of knitting establishments was 972. Today, statistics show nearly 1400, a wonderful increase in so short a period. The above includes machines for all styles of knit goods. So the manufacturers of today are not looking for slipshod or bungling workmen, for the fairly good is only tolerated until the best appears.

A short time ago, while in one of the large knitting plants in this country, I said to the proprietor, who was very friendly and standing by my side, "I suppose you are trying to keep step with all the latest inventions and improvements along your line of knitting?" His answer came very quick, "We do not simply try, but we do it. The goods we are making are equal to the best in the market, and some of our product goes across the ocean, and competes successfully with the products made there. If we did not equal the best,

we might just as well quit the business."

For an illustration, a short time ago, not a hundred miles from here, a firm started out with an abundance of capital. There was a good demand for their line of goods and there was, apparently, no reason why the enterprise should not succeed, but the manager of the business made the mistake of thinking that cheapness would atone for want of quality. Poor stock was utilized, and the help was not held to a high standard of excellence in their work. The result was that in less than two years, the firm went into the hands of a receiver, the mill was closed, and the business was discontinued. At practically the same time, and in almost the same neighborhood, another factory was started. The gentleman at the head of this enterprise possessed such slight means that he could employ but few workmen, and for months the business done aggregated but a few hundred dozens. From the first, however, the proprietor had one fixed principle, the goods he manufactured should be of the best. He purchased only stock of the first quality, and his help were urged to carefulness and thoroughness of workmanship. The product of the factory was carefully and neatly put up for shipment, and buyers always found the article delivered as good as the sample from which they ordered. The other manufacturers, close by, soon learned what this man was doing. The demand for his underwear soon compelled an increase in the size of his plant and the number of workmen employed. The proprietor has now earned a competency, and his business is regarded as one of the leading underwear factories in this State.

But good wormanship implies capable workmen, and the demand for the best product leads to a search for skilled producers. A jack-of-all-trades may be a useful individual to have around, when the work to be done consists simply in tinkering. The right kind of workman is the one who is an expert in the line of his calling. The best certificate of recommendation required is good work. Recommendations from employers are valuable, and if honestly given are a proof of what one has been able to do. The question, however, which the manufacturer asks of the applicant is not what the past has shown, but what can be done now. The world is filled with people who can do a multitude of things passably well. The great need is for one to know from beginning to end, the work that he is trying to do, and who stands ready to put that knowledge into practice with painstaking fidelity and thoroughness.

A. SCOTLAND.

A Novelty in Knitting Machines.

David McGenniss of the Ionic Knitting Company, on August 23d, 1898, was granted a patent for a blank for knitted underwear, consisting of a tube of tuck rib fabric having, at intervals in its length, blocks or sections of plain rib fabric. This blank, which was described in our October issue, is especially adapted for use in the manufacture of knitted underwear, and by its use a great saving is said to be accomplished both in material and time. It required, in order to satisfactorily produce this fabric, the invention of a special knitting machine.

This invention is looked upon as marking a very important advance in the art of making knitted underwear. It was formerly the practice to make tubes of suitable size for the cuffs of the arms and legs of undergarments, and to sew them to the body of the garment, but the seams were objectionable and that practice has been superseded to a very large extent by knitting a tubular blank of one character of stitch and at intervals therein, knitting integrally therewith a band of a different character of stitch which was adapted to form the cuffs of the garments. This practice in-

volved a large waste of about half of the cuff band, besides the waste of a large triangular piece of the body of the fabric. Inasmuch, however, as the garments having integral cuffs and body portions were much in demand by the purchasing public, it was only in the cheaper grades of underwear that the old practice was retained. By Mr. McGenniss's inventions this waste of material is entirely avoided and the blank may be cut into sleeves and legs of undergarments without any waste.

It is understood that a well known firm of knitting machine manufacturers will immediately put the machine on the market, and it is expected that they will be received with the greatest favor by manufacturers of knitted underwear. Both of these patents are stated to be broad and comprehensive in their scope by the inventor's attorneys, Phillips & Anderson of Boston, who have obtained a large number of very valuable patents for improvements in the textile art.

A Quandary Satisfied.

Editor Textile World:

Allow me to thank you for the replies to my inquiry, in the November and December issues of your journal. I have decided on 160-needle goods, plain, knit in the gray and dyed afterward. You advised me to sell in the East, or at a point where the goods may be dyed. I would like a little more light on this point. I suppose I would have to employ an agent. I have never sold in this way. What commission would be right? Would the agent guarantee accounts? It seems to me that the best way of selling goods is a very important question, worthy of thoughtful consideration.

There is another point I want to ask you about. What is the best make of ¾ automatic knitters? I have about decided to try some ¾s, and, if everything goes well, to add some 15-16th knitters. By the way, do you know that the Textile World is the best journal of its class?

HOSIERY.

(We are pleased to note that our correspondent has a good opinion of the Textile World. It is shared in by a great many others. In selling goods through a commission merchant, we would suggest communicating with parties in Chicago, being the nearest distributing point. We have given names of good houses, by mail. Information in regard to commissions and guaranteeing can be obtained from the parties. We cannot very well recommend, or even give, our opinion regarding the best make of three-quarter automatic, or any other knitting machine. In our advertising columns can be found the addresses of the principal knitting machinery manufacturers in this country. It would be well for our correspondent to communicate with them direct.—Editor.)

Removing Vegetable Matter from Wool.

We have received a number of inquiries as to processes now in use for the carbonization of vegetable matter in wool, and have replied by letter, referring to methods now in vogue. Carbonization is a comparatively new industry, though quite common at the present time. Formerly, the burs and other vegetable matter was taken out of wool mechanically, and even now this method is not wholly done away with. The chemical means that were depended upon for freeing wool from burs and other vegetable material, twenty-five or thirty years ago, were very crude compared with those now employed. Sulphuric acid was then and always has been the principal chemical depended upon for the destruction of vegetable impurities. In 1866, William Sykes, Glenham, New York, made a process of removing vegetable matter from wool the subject of a patent. It consisted of making a solution of sulphuric acid and water, of a strength from four to ten degrees Tw. In this solution, he

steeped, or soaked, the wool from eight to forty-eight hours, according to its condition as to the amount of vegetable matter in it. The acid solution was used either warm or cold, the former having a quicker or more powerful effect in removing the vegetable substance. After soaking sufficiently, the wool was removed from the solution and thrown into a bath of lime water for a short time, which, it is stated, had the effect of preserving the fulling properties of the wool intact.

In 1868, William H. Jubb, Norwalk, Conn., secured a patent for accomplishing the same object, by soaking the wool in a solution composed of sulphuric acid 100 parts, by weight, and refined saltpetre two parts, by weight, regulated according to the condition and nature of the wool. The action of this solution, it was claimed, reduced the vegetable matter to a state of powder, when the wool was placed in a neutralizing bath, to counteract the injurious effects of the acid, composed of sal ammoniac, four parts; soda ash, thirty parts; whale oil soap, ten parts; and lime, five parts. It was said that the wool was not injured by this process.

Changes in Australian Wool.

The members of the wool trade, as well as manufacturers, have observed for the last few years, marked changes, and in some respects, degeneration, in the character of the wool that comes from Australia. The clip of 1897 will long be remembered as an exceptionally poor one, due to a succession of drought seasons, which, in that year, had a particularly bad effect on the wool, not only on that grown in the hot, dry district throughout the Darling River valley, but in the more favored districts of Riverina. One of the results of this was an unusual scarcity of good combing staple, of fine quality, suitable for warp purposes.

The most conspicuous change seems to have an element of permanency in the decline of fine wools and the lowering of the high standard in quality that was so prominent twenty years ago. It is much more difficult now to obtain a fine fibred wool capable of being spun to 70s, or any higher number, and what is obtainable is that due, to some extent, to what has been termed "the fineness of misfortune," arising from untoward seasons and deficient feed. As stated in a circular issued by one of the prominent wool merchants of London: "It is difficult to say to what extent the deteriorated pasturage over large sections of the country can be held accountable for a share of the change, but the fact remains, that a really fine wool is an exceedingly scarce article, even in Tasmanian wools, which form so handsome a contingent of the yearly supply. It is rarely that a uniform fine lot presents itself, most of the superior clip containing fleeces which are more or less tainted with a broad strain."

According to the best statistical information that we are able to obtain, the quantity of merino wool available in the London market, for 1897,—due to the extensive increase of coarse wooled sheep in Australia,—had diminished in two years over 22 per cent.; and the comparison of the wools offered at the sales for 1898, with those for 1895, exhibited a gross diminution in merinos catalogued, of nearly 39.5 per cent.

Skirting Wool Fleeces.

The following from The Dalgety Company, Sydney, N. S. W., wool merchants, in reference to the skirting of Australian wool fleeces, will, undoubtedly, be considered worthy of attention from those who are now so earnestly discussing the amount of wool taken from a fleece as skirts.

Editor Textile World:

We have your favor in reference to the average skirting of Australian fleeces. The information asked for is

on a matter affected by such widely differing conditions that it is not possible for us to definitely state the standard on which wool growers work, for the simple reason that each owner follows out his own plan in regard to skirting, and takes off little or much as he thinks is required or is desirable. As soon as the busy part of the wool season is over we will get the views of some of our country friends on this particular subject, and after hearing from them will give you the consensus of opinion in regard to it.

Acetylene Gas.

The use of carbide of calcium and acetylene gas has again received the attention of insurance companies, regarding their safety as a fire risk. It appears that new efforts are now being made to permit the introduction of acetylene gas, and additional uses are said to have been discovered for carbide of calcium, in regard to which insurance companies are not satisfied as to their safety. At the time when this gas was introduced to the public it received severe criticism, as being dangerous, which was demonstrated in a number of instances in disastrous explosions. It is said that since then many improvements have been introduced which render its use unobjectionable from an insurance point of view. This, however, has not been clearly demonstrated to the satisfaction of insurance companies. Particular attention has been called to this matter by the Boston Manufacturers' Mutual Fire Insurance Co. In relation to the possible use of this gas for factory purposes, this company suggests that, before introducing it, it be consulted.

As not entirely foreign to this, it may be stated that another method of lighting factories by kerosene oil, converted into gas, in a somewhat novel manner, has been called to the attention of insurance companies, and the latter advised that nothing be done with it without first investigating it thoroughly. It is said to possess some merits, but thought to be accompanied by more or less danger.

New Hampshire Industries.

The Commissioner of Labor for the State of New Hampshire has recently submitted his second biennial report for the year 1897-98, in which we find that, of the 350 establishments making returns, 43 industries are included, showing $34,422,907 of invested capital. Cotton goods represent by far the largest amount of capital invested in any industry, the 13 establishments considered reporting $13,147,207 capital; and 13 establishments in woolen goods report an investment of $2,591,500 capital. The invested capital in 15 establishments in the hosiery industry is reported as $1,425,500.

The cost of material used for cotton goods was $7,546,550; woolen goods, $2,538,840; and hosiery, $978,028.

The total paid in wages for cotton goods was $3.208,176; woolen goods, $814,036, and $530,277 for hosiery.

The textile industries report over a million dollars each in value of product, to wit: Cotton goods, $15,677,296; woolen goods, $3,973,652; hosiery, $1,844,203, and cotton and mixed textiles, $1,033,457. 12,350 persons were employed in the cotton-goods industry, of whom 7162 were females; hosiery, 2099, of whom 1305 were females; woolen goods, 2124.

—Wool spinning in ancient times was not so light and agreeable an occupation as that of flax. Enterprising dames could not carry the great wool wheel to a neighbor's house for a day's spinning and so the industry must, perforce, be accomplished at one's own fireside.

—Build your mill so substantially that, when the machinery is set up and running, there will be the least possible amount of vibration.

POWER DEPARTMENT

ELECTRICITY—STEAM—WATER.

Chalk Talks.

BACK PRESSURE VS. EXHAUST STEAM HEAT.

In plants where steam power is used, it is often a question whether it is an advantage to use the exhaust steam from engines for heating, or draw steam directly from the boilers for this purpose.

The doubt arises because, when the exhaust steam is used in the heating system, a back pressure of from one to two pounds is set up in the engine cylinder.

It is sometimes claimed that this back pressure causes the engine to use steam above its normal requirement, to an amount greater than would be required to supply heating system from the boiler direct through a reducing valve.

Obviously the solution of this question depends on the relative value of steam from the boiler through reducing valve and exhaust steam in the heating system, heat taken from exhaust steam by feed water heater, the effect of back pressure on engine efficiency, and whether all the exhaust steam can be used for heating.

Steam at ordinary boiler pressure contains but little more heat than at pressure of atmosphere. For example, at one hundred pounds gauge pressure, the total heat of evaporation per pound of steam above 32 degrees is about 1185 heat units, while at pressure of atmosphere one pound of steam contains 1146 heat units above 32 degrees.

From the above it is evident that were steam at boiler pressure let into the heating system, the advantage could not be noted. Furthermore, it is not best to expose steam heating system to high pressures, and the usual practice is to use the reducing valve for pressure from two to five pounds in heating pipes.

As exhaust steam has the same heating value as steam of same pressure from reducing valve, the two stand equal on this count.

Next comes the question of heat taken from exhaust steam by the feed water heater, to see whether steam from it has enough heat remaining in it to make its use advisable.

It may be fairly assumed that the water going through heater is all used for steam, and on this basis calculation shows the heat available per pound of steam entering the heater, feed water having been heated to 212 degrees, to be 966 heat units above 32 degrees per pound of steam.

Taking now the case of steam at one hundred pounds boiler pressure, when each pound of steam contains 1185 heat units above 32 degrees, it is found that about 81 per cent. of the total heat of evaporation is available in the steam after the feed water has been heated.

Next in order, the effect on the power and efficiency of engine should be determined.

With a mean pressure on piston of fifty pounds, and a back pressure of two pounds, the power of engine will be decreased 4 per cent., but this power can be regained by an increase of two pounds in the mean cylinder pressure.

In the case of an engine developing one hundred horse power, a loss of 4 per cent. amounts to four horse power. As one horse power is equal to 2565 heat units per hour, the total loss is shown to be 10260 heat units per hour.

Suppose the engine to require thirty

HEAT UNITS 1 LB. STEAM 1146
1 LB. WATER 32° TO 212° H.U. 180
H.U. REMAINING 1 LB. STEAM 966

H.U. 1 LB. STEAM AT 100 LB. B.P 1185

$\frac{966}{1185} = .81 = 81\%$

81% = HEAT RATIO HEATER STEAM TO BOILER STEAM.

LOSS IN ENGINE POWER AT 50 LBS. MEAN AND 2 LBS. BACK PRESSURE

$\frac{2}{50} = .04 = 4\%$ = LOST POWER

4% OF 100 H.P. = 4 H.P.
1 H.P. = 2565 HEAT UNITS PER HOUR
4 × 2565 = 10260 = HEAT UNITS LOST

HEAT UNITS PER HOUR IN EXHAUST STEAM FROM 100 H.P. ENGINE AFTER PASSING THROUGH HEATER
966 × 30 × 100 = 2898000 H.U.

RATIO EXHAUST STEAM HEAT TO LOSS IN ENGINE

$\frac{2898000}{10260} = 282$ TO 1

BACK PRESSURE VS. EXHAUST STEAM HEAT.

pounds of steam per horse power per hour, and we find the heat units available after feed water has been heated to be 2,898,000 units above 32 degrees, or more than two hundred and eighty times the four horse power lost.

It should be noted that this last computation is based on the use of all heat in exhaust steam down to 32 degrees, so that if heat can only be used down to say two hundred degrees, the saving would be decreased about 1.6 per cent.

Should it be possible to use only a small part of the exhaust steam for heating or other work, the loss in engine might be greater than the heat used from exhaust steam, but such a case would be unusual.

Valuation of Textile Manufacturing Property.

Paper read by Charles T. Main, Boston, Mass., before the American Society of Mechanical Engineers.

The two most important things which determine the market value of machinery are: First, its comparative ability to turn out a product in quantity and quality equal to that of the most improved machines. Second, its actual condition with respect to wear and tear.

Although a machine may not be worn out, or even may have been run but very little, it may be unprofitable to run, because other machines have been introduced which do so much more or much better work. These machines may be used to advantage in some other concern, and may on this account have more value than scrap. Parts of machines have been improved so that these portions may be changed while leaving a portion of the machine as before; as, for example, cotton-spinning spindles, so that depreciation might be applied to a portion of a machine instead of to the machine as a whole.

The depreciation for actual wear and tear will vary with the severity of the work done, speed of the moving parts, the care taken in the running, and the amount laid out in repairs.

It seems to me impossible to separate the depreciation from wear and tear altogether from that due to improvements in arriving at its present value, and it is customary to treat them in a general way, allowing a definite depreciation to cover both.

Any concern which does not lay aside at least 5 per cent. of the total value of its plant if new, and apply the same at intervals towards the renewal and improvements, will find itself at the end of twenty years in a position not able to compete with success with modern equipped concerns, and it will be necessary to make radical changes at great expense, calling for new capital.

It is often stated that there is no depreciation during the first year of running; that the machinery will do better work after it is limbered up and adjusted than when it is set to work. As a matter of fact, depreciation does begin immediately, although not perceptibly. After the first year, depreciation is charged sometimes at a uniform rate of 5 per cent. over all the machinery, due allowance being made for any renewal of parts outside of ordinary repairs. I have used, in several cases, a depreciation of 5 per cent. up to the dressing-room, and 4 per cent. for the dressing-room and beyond. This view has been presented to me by a member of the society, that after the first year the depreciation should be marked off 5 per cent. to 10 per cent. a year, until the value is brought down to one-half the original cost; then to maintain its value about level for awhile, until it becomes apparent that it would soon be profitable to replace the machinery, when the depreciation goes on at a more rapid rate. This method may be proper for a mill to pursue in its own book-keeping, but it is not quite definite enough in making up a valuation for purchase, etc. It is sometimes the case that some of the machinery is older than these rates would allow them to be in existence, but they may be still there, perhaps for the same reason that the bridge remained which the engineer had fig-

ured could not hold up its load. When asked how he explained the fact that it did stand up, he said that the only reason that he could give was that it stood from force of habit. Some machines remain and do work long after it would be profitable to replace them. The value of such machinery to a purchaser is practically nothing, except that it may complete the organization of the mill and allow it to run until it can be replaced by new machinery.

If a sinking fund is created for replacing the machinery, 3 per cent. of the cost would replace it in twenty-four years. There is usually some value to machinery in a mill, even if the property were to be dismantled; but old machinery has no value except for scrap, which is very small, as the cost of taking down is about as much as the value of the scrap.

With belting, if a mill has been running for some time, it is customary to place its value at one-half the cost if new, for the machine belts are being renewed occasionally. With piping the examination should be made to see if the steam pipes are proper for the most economical method of heating, or if they would have to be replaced, and if the pipes for hydrants and sprinklers themselves are such as would be approved by the factory insurance companies, or would have to be replaced, and to see what the condition of the pipe is. It should also be noted if the steam pipes are properly covered to prevent radiation.

There is a special value attached to a mill which is running and in which the purchaser might immediately commence work. There is considerable expense incurred in starting up a mill which is idle, and a large amount of expense in building, equipping and organizing a new mill, which is not fully realized until paid for. The purchaser is able to begin immediately to manufacture and to realize a profit in good time. All of these things are in favor of an existing plant. There is also the advantage of investing less capital at the start, and if the arrangement and organization is such as may be improved and modernized, these improvements can be paid for out of the earnings instead of from the capital. On the other hand, if the capital can be obtained, it may be wise to be liberal in its expenditure and to begin as quickly as possible to reap the full benefit of the new and up-to-date plant.

The valuation for bonding or raising money should be based upon the market value, but no more money should be borrowed or loaned than the amount which the property would bring at a forced sale, and this value is likely to be considerably less than the market value.

About the only portions of a plant which are leased are the land and buildings and the power plant. More often this is limited to a portion of a building with power and heat furnished. In nearly all cases the lessee furnishes his own machinery.

The problem which presents itself to the lessee is whether it is cheaper for him to build, if he has the capital or can borrow it, and maintain a plant of his own, or pay for rent and power, which requires a smaller expenditure of capital and less care, and affords an opportunity of testing the desirability of continuing a business or not, without so much chance for loss.

The rental value of a power plant depends upon its character and efficiency to produce power cheaply. The cost of producing power in small amounts is very much greater than in large amounts, and the amount which the lessee should pay may be obtained in comparison with the cost of producing the amount of power required with a reasonably efficient plant with steam power or by some other means.

The rental value of land for certain purposes of manufacture cannot be more than other land equally adapted to the same purpose, unless it has some peculiar advantage of location, convenience to railroads, nearness to other mills to be supplied with the product of this mill.

Taxable Value.—The Public Statutes of Massachusetts, Chap. 11, Art. 45, states that the assessors shall

make a fair cash valuation of all the estate, real and personal, subject to taxation therein. It seems as though this definition of the cash value as the taxable value did not intend that assessors should consider the plant in the same light that a purchaser would, for the reason that the earnings cannot be included in the assessor's investigation, while they are the all important item to the purchaser.

The average assessor knows but little about the physical qualities, to say nothing of going into the estimate of all the items which make a mill more or less profitable, than other mills located elsewhere.

Graphite in Paint.

Considerable has been written lately about an old sign in possession of the Western Society of Engineers at Chicago. The words "Harper's Ferry," painted in black, stand out as boldly as when they were first formed by the artist's brush, while the wood around the letters, which was painted with white paint, has worn away about one-sixteenth of an inch. It is asserted by the writers that no paint manufactured nowadays is equal in durability to that which was applied on the old sign.

Wm. Hooper, Ticonderoga, N. Y., does not see anything specially remarkable in the preservation of the old sign, and claims that there is just as good a paint made nowadays as then. He adds: "I have seen signs that have been painted with black paint directly on the clapboard of the building. The lettering was good after the paint on the balance of the building had disappeared, and after this the whole building was painted over, lettering and all, and the lettering obliterated; yet within ten years afterwards the old black lettering appeared again quite freshly to view. I suppose the paint for the lettering was made of linseed oil and lamp black. I believe, however, that finely ground graphite mixed with pure linseed oil, will last as long, or longer, than any other paint ever known of or used. I had a large iron casting which laid in my mill yard for over thirty years. It was painted with only one coat. The old casting was broken up and sold for old iron last month, and I noticed that the paint on the pieces of casting, even after being broken up, looked quite fresh.

"If the surface to be painted is perfectly dry when the finely ground graphite is applied, the paint will prove the most lasting paint known, because if time eliminates all of the oil, the graphite seems to adhere to the surface painted, just the same as a piece of paper or wood will appear after it has been rubbed with a lead pencil or a piece of graphite. No other pigment known to me will remain on the surface painted after the oil has been thoroughly destroyed. With the experience I have had with graphite paint, I thoroughly believe that if any dry surface be covered with graphite paint and left untouched for a period of 30 years—by which time the oil will have disappeared—no doubt a letter could be written plainly on the surface by using a piece of large wire or nail after smoothing the end of the wire or nail which is to be used as a pencil. I have done all this and shown it up to others. Writing with the piece of wire polishes the graphite which adheres to the surface, showing that it is there still."

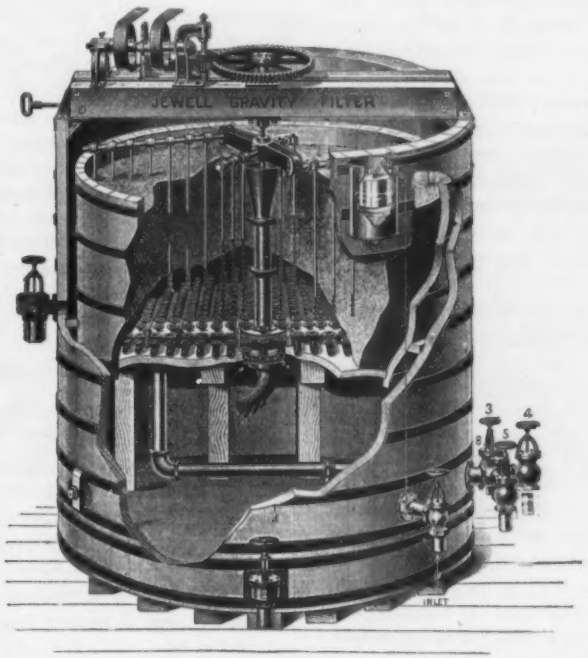
—A beautiful red was produced on wool by colonial dames from the cochineal and madder. Logwood was readily used in the domestic manufacture. All shades of yellow and dark brown were obtained from the bark of the hickory nut, and the flower of goldenrod, with alum, made a good yellow. Copperas also made a yellow dye. The yellow wool dipped into the blue indigo pot made various shades of green. Black was formed from red oak bark. A violet dye was sometimes obtained from the faded leaves of the fleur de lis.

Pure Water for Textile Mills.

We have recently been looking into the question of filtration and its value in connection with the textile industries, and from what we have learned we are surprised to find that every textile mill in the country is not supplied with an apparatus for purifying its water. The testimony of representative concerns who have installed such apparatus is so convincing that we feel all our readers cannot appreciate the importance of the subject, or they would have their mills equipped the same as the representative ones we have in mind.

We find upon inquiry that many textile manufacturers are beginning to realize the necessity of clean water for a better cleansing and finishing of their product, and it has been proved by many costly experiments that ground water or water taken from artesian wells is not to be depended upon as it frequently contains iron and other matters in suspension and solution, which render it unsuitable for the best class of work. The fact that with a uniform supply of clean, white water, the quality of bleach and dyestuffs can be unalterably fixed is a point which in itself is a recommendation to all textile manufacturers, and in these days of close competition, the value of the bleach and dyestuffs saved and an unvarying color of the goods when finished, make the necessity of clean water more and more apparent every day.

In a recent issue we illustrated a form of pressure filter manufactured by the New York Filter Mfg. Co. of New York.



In this issue we present a cut of the Jewell type of gravity filter manufactured by the New York Filter Mfg. Co., and by reference to the cut it will be seen that the water receives a preliminary settling in the chamber shown beneath the filter proper, and in the recent exhaustive experiments made by the Water Board at Louisville, Ky., it was found that over 75 per cent. of the suspended matters in the water was removed by this cham-

ber before the water passed to the filter bed. This large amount of sedimentation was not simply due to sedimentation by natural laws of gravity, but to the special feature embodied in this Jewell type of filter whereby the water is given a rotary motion which causes a much faster precipitation than if the water were completely at rest.

Before the water enters the settling chamber it receives a minute charge of alum solution, in most cases one-half pound of the chemical being sufficient for 14,000 gallons of water, and on repeated trials both at Louisville, and elsewhere, it was found by analysis that not a trace of alum appeared in the filtered water. This fact should remove all prejudice from the minds of manufacturers as to the use of alum; and the fact that the leading silk mills in the country use the New York Filter Co.'s various types of filters embodying the use of alum, and have no trouble at all with their finest and most delicate shades, should also be convincing proof as to the use of alum.

It is not our intention in this article to give a full description of the construction of the filter, as the manufacturers would be glad to cover that point if requested.

We think that when such firms as Geo. C. Hetzel & Co., the well known manufacturers of worsteds and woolens, Chester, Pa., go on record in the following language, it should carry conviction to every textile manufacturer in the country.

"We are pleased to inform you that the Morison-Jewell Gravity Filter we have in use has given us satisfaction in every particular. We have spent a great deal of money in experimenting with filtration, and not until we adopted yours did we get any results that were of any value. We pump the water direct from the Delaware River and the condition of the water is so variable that it has always been impossible for us to count with any certainty upon duplicating shades in our dyeing, but the water passed by the filter now being always the same, enables our dyer to get first-class results at all times, and we would not be without it for many times its cost."

Why should the exhaust pipe on a steam engine be larger than the steam pipe?

To avoid having excessive back pressure on the piston, it is necessary to have a greater area for the passage of the exhaust steam from the cylinder. As steam expands, it becomes reduced in pressure, and increases in volume, and therefore requires a larger area for its passage. The area of the steam pipe of an engine is calculated from the basis that steam is admitted during full stroke, the allowable mean velocity of the steam through the pipe being 6000 feet per minute.

Then, area of cylinder $\times$ piston speed $\div$ 6000 = area of steam pipe.

For exhaust pipes it is advisable that they should be calculated for a velocity not exceeding 4000 feet per minute. Then, area of cylinder $\times$ piston speed $\div$ 4000 = area of exhaust pipe.

Take for example, an engine with a cylinder 15½" in diameter, 36" stroke, making 100 revolutions per minute. Area of cylinder = $15.5^2 \times .7854 = 190$ square inches (nearly).

$3' \times 2 \times 100 = 600$ feet piston speed per minute.

$190 \times 600 \div 6000 = 19$ square inches area of steam pipe, or 5" diameter of steam pipe.

$190 \times 600 \div 4000 = 28$ square inches area of exhaust pipe, or 6" diameter of exhaust pipe.

—Wool spinning was made an honorable occupation for women in the ninth century by the mother of Alfred the Great. She was a spinner of wool, or, to use the name afterward adopted, a "spinister," and she taught her daughters the art of wool spinning. From that time up to the commencement of the present century the spinning of wool was done by women, and their industry was only equaled by their skill, it being the pride of a good "spinister" to make the finest yarn and plenty of it.

DYEING DEPARTMENT.

Dye Recipes for February.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 17.

Violet on Worsted Yarns.

Violet O B on 100 pounds worsted yarn.

Prepare dye bath with

2 lbs. Violet O B.
(Anchor Color Mfg. Co., 462 Cherry St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 120°, bring to a boil, while turning, and turn to shade at that heat.

Violet O B is a very concentrated and fast color. The dye works perfectly level on the fibre, and combines readily with acid dyes or extracts.

RECIPE NO. 18.

Very Dark Blue on Worsted Yarn.

The Amend Mordanting process on 100 pounds worsted yarn.
(Controlled by the Amend Process Co., 205-211 Third Ave., New York.)

Prepare dye bath for mordanting with

6 lbs. Acetic Acid, 30%.

Turn one-half hour at 140°.

Then add to same bath a solution of

1 lb. Chromic Acid.

Turn one-half hour, and let temperature drop.

Add to bath

6 lbs. Bisulphite of Soda.

Bring temperature up to 140°, while turning, and turn one-half hour at that heat. Rinse off.

Dye in Extract Logwood bath in the regular way, with

½ lb. Ammonia, 20%

added to the dye bath.

The Alizarine Blue shade shown last month is dyed a full, dark color, with a fine bloom over hand.

The Logwood dyed sample shows, also, a fine, clean shade of a bluish black, which can be easily made into a jet black, with the addition of Alizarine Yellow, or fustic.

RECIPE NO. 19.

Red on Worsted Yarn.

Wool Red 6529 on 100 pounds worsted yarn.

Prepare dye bath with

2½ lbs. Wool Red 6529.
(Hanna-Schoellkopf & Co., 135 No. Water St., Philadelphia.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 130°, bring to boil while turning, and turn to shade at that heat.

Wool Red 6529 works slowly and level on the fibre, and dyers of piece goods will find it a very valuable color, as it penetrates the fibre thoroughly. (See recipe No. 9, January, for this dye in combination with New Fast Red, and recipe No. 31, this issue.)

RECIPE NO. 20.

Light Green on Cotton Yarn.

Direct Green C on 100 pounds cotton yarn.

Prepare dye bath with

1 lb. Direct Green C.
(John J. Keller & Co., 104 Murray St., New York).
20 lbs. Common Salt.

Enter yarn at boil, and turn one hour at that heat.

See recipe No. 30, this issue, for comments and for a darker shade of green.

RECIPE NO. 21.

Orange on Cotton Yarn.

Direct Orange C R R on 100 pounds cotton yarn.

Prepare dye bath with

2½ lbs. Direct Orange C R R.
(A. Klipstein & Co., 122 Pearl St., New York.)
20 lbs. Common Salt.

Enter yarn at boil, and turn one hour at that heat.

Direct Orange C R R will be found a serviceable color, as it produces a fine shade of orange in one dip, and can be used for combining with other direct dyes. (See recipe No. 14.)

RECIPE NO. 22.

Medium Blue on Worsted.

Blue A and Violet R on 100 pounds wool yarn.

Prepare dye bath with

2½ lbs. Patented Blue A.
½ lb. Fast Acid Violet R.
(Victor Koechl & Co., 122 Hudson St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 140°, bring to boil while turning, and turn to shade at that heat.

These dyes, separately, and in combination, have appeared in previous recipes, as follows: Fast Acid Violet R, in No. 133, for a violet red, and in No. 149 (October) for a violet; Patented Blue A, in No. 138 (September) for a light greenish blue; and the two in combination, in Nos. 162 and 175 (November) for medium and dark blue, respectively. See comments in these recipes.

RECIPE NO. 23.

Black on Cotton Yarn.

Pluto Black R on 100 pounds cotton yarn.

Prepare dye bath with

6 lbs. Pluto Black R.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
25 lbs. Glauber's Salt.
2 lbs. Soda.

Enter yarn at boil, and turn to shade at that heat.

The Pluto Blacks, as shown in previous recipes, are of a highly concentrated strength and will be found to produce good blacks at a comparatively low cost. The different brands of Pluto Blacks, sold by this concern, will enable the dyer to produce any shade of black that is needed. (See recipe No. 179.)

RECIPE NO. 24.

Red on Cotton Flannel.

Brilliant Safranine G on 100 pounds cotton flannel.

Mordant in the usual way with Sumac and Tartar Emetic.

Rinse off, and dye in a bath of

8 oz. Brilliant Safranine G.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)

Enter cloth at 120° and bring temperature up to 150°, while running, and run three-fourths hour at that heat.

Brilliant Safranine G being a pure and rich color will dye fine shades on silk, and for cotton goods and yarn, it is very well adapted, on account of its level dyeing.

RECIPE NO. 25.

Dark Blue on Worsted Yarn.

Alizarine Lanacyl Navy Blue 3 B and Violet B on 100 pounds worsted yarn.

Prepare dye bath with

2 lbs. Alizarine Lanacyl Navy Blue 3 B.
1 lb. Alizarine Lanacyl Violet B. Pat.
(Wm. J. Matheson & Co., Ltd., 183 Front St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 140°, bring to boil while turning, and turn one hour at that heat; then add another

5 lbs. Acetic Acid

and turn 20 minutes at boil. Rinse off.

By combining the above two colors, different shades of blues can be obtained, and as they combine and work level together, the dyer will have no trouble in getting his shades. (See recipe 185, December issue, and a number of previous recipes in which these dyes have been used for the production of various shades.)

RECIPE NO. 26.

Reddish Brown on Cotton Yarn.

Diazyl Brown T on 100 pounds cotton yarn.

Prepare dye bath with

3 lbs. Diazyl Brown T.
(C. Bischoff & Co., 87 Park Place, New York.)
25 lbs. Common Salt.
2½ lbs. Soda.

Enter yarn at boil, and turn one hour at that heat.

We show in this recipe a direct dyeing of Diazyl Brown T, which is one of the many shades produced with the Diazyl colors. The shade shown, while being of a reddish cast, will be found of great service to the dyer, both for extra light shades and for combining. The importers have several brands of these colors, which dye different shades. (See recipes 183 and 190 in the December issue, and recipe 15 in the January issue, for shades from other brands of this dye.)

RECIPE NO. 27.

Dark Blue on Worsted Yarn.

Logwood Liquor for Wool on 100 pounds worsted yarn.

Mordant at boil for 1½ hours with

3 lbs. Bichromate of Potash.
2 lbs. Tartar.

Rinse, and dye in separate bath with

5 lbs. Logwood Liquor for Wool
(Stamford Mfg. Co., 133 Front St., New York.)
2 lbs. Alizarine Blue paste.
2 lbs. Acetic Acid.

Turn for one hour at boil, and wash.

The above is a fast, as well as a dark and full shade of blue. It is fast to all tests, and cheaply applied, showing that Logwood Liquor for Wool is well adapted for combining with alizarine and other dyes. (See recipe No. 12.)

RECIPE NO. 28.

Golden Tan on Cotton Yarn.

Thiocatechine No. 1 on 100 pounds cotton yarn.

Prepare dye bath with

7 lbs. Thiocatechine No. 1.
(Sykes & Street, 85 Water St., New York.)
10 lbs. Common Salt.
10 lbs. Carbonate of Soda.

Enter yarn at 140°, bring temperature up to 200° while turning, and turn one hour at that heat. Rinse off and turn for one-half hour at 140°, in a separate bath of

5 lbs. Bichromate of Potash.
5 lbs. Sulphuric Acid.

Rinse.

See previous recipes for comments. In recipes 186 (December), 5 and 11 (January), will be found Nos. 1 and 2 of this dye, in combinations for tan browns.

RECIPE NO. 29.

Pink on Cotton Flannel.

Oleine on 100 pounds cotton flannel.

Prepare dye bath with

2 lbs. Oleine.
(Bosson & Lane, 36 Central Wharf, Boston.)
3 oz. Erika 4 G N.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
10 lbs. Glauber's Salt.

Enter cloth at 120°, bring to boil while running, and run three-fourths hour at that heat.

When Oleine is used in the dye bath, it helps the color to penetrate and go on to the goods evenly. It also assists in producing better shades in quicker time, and leaves the cloth or yarn in a very soft condition. (See recipes Nos. 29, 86 and 160, in 1898 Supplement.)

RECIPE NO. 30.

Medium Green on Cotton Yarn.

Direct Green C on 100 pounds cotton yarn.

Prepare dye bath with

2 lbs. Direct Green C.
(John J. Keller & Co., 104 Murray St., New York.)
25 lbs. Common Salt.

Enter yarn at boil, and turn one hour at that heat.

Direct Green C can be combined with other direct colors for a number of shades, as it works very level on the fibre. (See recipe 20, this issue.)

RECIPE NO. 31.

Red on Worsted Yarn.

Wool Red on 100 pounds worsted yarn.

Prepare dye bath with

1¼ lbs. Wool Red 6529.
(The Hanna-Schoellkopf Company, 135 No. Water St., Philadelphia.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 130°, bring to boil while turning, and turn to shade at that heat.

Wool Red 6529 will work very level on the fibre. The color itself is very soluble, and can be used with other acid colors for combination shades. (See recipe No. 19, this issue, and No. 9, January issue.)

RECIPE NO. 32.

Very Dark Blue on Worsted Yarn.

Chrome Blue on 100 pounds worsted yarn.

Mordant for two hours at boil with

3 lbs. Bichromate of Potash.
2 lbs. Cream Tartar.

Rinse, and dye in separate bath with

4 lbs. Chrome Blue.
(O. S. Janney & Co., 8-10 Letitia St., Philadelphia.)
5 lbs. Acetic Acid.

Enter yarn at 130°, bring to boil while turning, and turn to shade at that heat.

Chrome Blue is a new color, and will be found of great value on account of its fastness. It is very concentrated, and strong, going evenly and slowly on the fibre. It is very soluble, does not rub, and will combine with other colors mordanted with chrome. It stands scouring and milling.

New Dyes.

We give in this issue, recipes for the use of five dyes that have not heretofore appeared in our columns, and which will particularly attract the attention of those who are in regular receipt of the Dyers' Supplement, as showing peculiarly handsome shades.

In recipe No. 17, Violet O B, furnished by the Anchor Color Manufacturing Company, New York, appears, for the production of a violet on worsted yarn. This is represented as a very strong and comparatively inexpensive dye, and various shades can be obtained with it, in combination with other anilines. We think that it would be worth the while of dyers to look into its merits.

John J. Keller & Company, New York, have represented in recipe No. 20, their Direct Green C, for the production of a light green on cotton yarn. This dye is an inexpensive color, and generally used for dyeing cotton, by the addition of common table salt, at one hour's boil. This article is also well adapted for union goods, as it dyes cotton and wool the same depth and shade of color. It is fast to light and washing, and stands acid very well, hence it can be used for cross dyeing. It does not change during hot drying.

An exceedingly attractive red on cotton flannel is to be seen in recipe No. 24, obtained from the use of Brilliant Safranine G, furnished by the New York and Boston Dyewood Company, New York. This product is used precisely as the ordinary safranine, which most dyers are familiar with. The dye we represent is an unusually bright and full safranine, and is well adapted to the dyeing of both silk and cotton.

C. Bischoff & Company, New York, supply their Diazyl Brown T, in recipe No. 26, for the production of a reddish brown on cotton yarn. A bright shade is produced by this dye, which is very fast to washing, and is especially suitable for wool and cotton mixed goods, producing colors very uniformly on both materials.

Dyers will be attracted to recipe No. 32, showing a very dark blue on worsted yarn, obtained from the use of Chrome Blue, sold by O. S. Janney & Company, Philadelphia. This dye combines well with dyestuffs working on a mordant of chromium, and is well adapted for the production of compound shades. The shades pro-

duced by this dye are absolutely fast, resisting washing, scouring, fulling, light, etc., and as the color develops slowly, there is no trouble in producing level dyeings.

Finishing of Dyed Goods.

The processes involved in the finishing of dyed and printed cotton cloths do not differ to any marked extent from those employed in the finishing of white cloths; the main difference is that greater care must be taken by the finisher to maintain the brilliancy and solidity of the colors; to see that in printed and woven colored goods the colors do not run into one another and into the whites.

The necessity of not using any material or process that will in any way affect the colors of the cloths, by discharging them or altering their shades or tints in any way is alluded to in an article that appeared, quite recently in the "Dyer and Calico Printer." The risk, it appears, is not very great; few of the materials used by the finisher have any such action, magnesium and zinc chlorides are perhaps, the most likely substances to be exceptions and the use of acids and alkalies in making the mixings must be strictly avoided. Flour paste, especially if old, should not be used owing to its tendency to become acid, which might affect some fugitive colors. It is impossible to describe in detail how all the colors which are used in the production of printed cotton cloths are affected by the condition, alkaline or acid, of the ingredients of the stiffening mixture; a few general points may however, be noticed.

The so-called mordant of alizarine colors are not affected by any condition of the stiffening mixing; they are perfectly fast. What are known as the basic coal tar colors, such as magenta, most greens, most violets, alkaline blue, soluble blue, and others, are slightly affected by alkalies, the color having a tendency to be weakened or discharged, and therefore the mixing used for cloths dyed or printed with these should be slightly acid, or better neutral, rather than alkaline. Most of the azo colors, such as the Croceines, Cotton Scarlets, and the acid colors, Acid Magenta, Acid Violet, etc., require the mixing to be quite neutral to yield good results. The great proportion of these azo and acid coloring matters are not used for dyeing or printing cotton fabrics, having no affinity for that fibre, and therefore not yielding fast colors on it. The introduction of the benzidine diamine colors, such as Congo and the Direct Reds, Benzopurpurine, Chrysamine, Diamine Red, Diamine Black, Chrysophenine, Titan Red, etc., gave at first a great amount of trouble to finishers, as most of these colors, especially the reds, are so sensitive to acids that it was no uncommon thing for a finisher to find that the reds on his pieces had turned blue black. The remedy however is simple, the mixing must be kept alkaline.

Cloths dyed or printed with some of the direct reds as Congo Red, Benzopurpurine, Hessian Purple, Diamine Red, and other reds of this group of coloring matters should be finished with starch rendered alkaline with a little soda crystals if a stiff finish is required, or with soluble oil made alkaline with soda for a soft finish. The alkali in the mixing helps the color to stand exposure to air and light much longer than it otherwise would. If Epsom salts are used a slight addition of carbonate of soda should be made. A mixture of sulphate of soda, salt and soda crystals would make a good stiffening mixing for these reds. A few of the direct reds will resist a weak acidity in the mixing. Some of the Yellows, Chrysamine, Hessian Yellow, Chrysophenine, are affected by alkalies generally going brownish, and therefore the mixing must be as neutral as possible.

For the Blues, Azo Blues, Benzoazurines, Diamine Blues, Titan Blues, the mixing should be neutral, although they will not be affected even if it be slightly alkaline or acid.

One point of importance in connec-

tion with the direct blues is to keep the temperature low, as many of them are affected by heat, which reddens the shade; in some cases the original shade comes back on cooling, but in others it does not.

The use of prepared mixings should be avoided, owing to the uncertainty as to the nature of their ingredients, which might contain injurious bodies. Starch, china-clay, mineral, barytes, salt, magnesium sulphate (Epsom salts), are perfectly neutral bodies, and may be used without fear for finishing this class of goods. In the sizing of yarns dyed with the red and blues of the substantive colors, a difficulty is experienced in that the simple starch or flour size which is used does not appear to take on the yarn, and in consequence it does not weave well; this can be remedied by adding to the first mixing 1 lb. of soda ash, then for every 25 lb. of yarn sized adding ¼ lb. more. Starch size is better than flour size, especially for the reds; the acidity of the flour size is so variable that its action on the color cannot be depended on.

The second fault, that of the colors running, is to a large extent beyond the control of the finisher, and is often due to the faulty fixation of the colors by the dyer and calico printer, or to the use of loose colors in the production of dyed and printed cloths; the only thing the finisher can do in cases where he finds the colors have a tendency to run, is to work as quickly as possible, not to allow the goods to remain wet too long, and to dry them off quickly.

The first of three things noted above the maintaining of the brilliancy and solidity of the colors, is very important, and to do so the finisher must be careful as to what materials he uses in his mixings; such bodies as china-clay, mineral, barytes, tend to make colored goods look chalky, and have therefore to be used as sparingly as possible. The fault arises from the opaque nature of these bodies; they lie on the surface of the cloths and therefore tend to hide the color of the cloth on which they are applied.

Starchy preparations and flour have the same fault to a smaller extent, and for the same reason. Dextrine, Epsom salts, sulphate of soda, salt, which are transparent, form the staple constituents from which the great bulk of the mixings for colored goods, should be made. Sometimes, for self-colored dyed goods, the mixings are colored to suit the color of the goods; when this is followed care must be exercised, although there is nowadays no great difficulty experienced in matching any required shades by using one or more of the numerous direct colors.

The dyes used in producing blacks are varied. These are Logwood Blacks, Aniline Blacks, Diamine Blacks, Direct Blacks, Cross Dye Blacks, Vidal Blacks, Sambesi Blacks, etc., etc. Then the character of the cloth differs greatly and the finishes applied vary equally as much. The mixings used with black cloths will have to be varied according to the character of the finish required. Blacks produced from logwood require a neutral finish or one that is slightly alkaline; acid mixings tend to redden the black, while strongly alkaline ones will turn them bluish in tone. A good mixing for logwood black would be starch liquor at 12 deg. Tw., 50 gal., soluble oil 2 gal., Glauber's salt 10 lb. Aniline blacks are unaffected by any kind of finishing mixing, and much the same may be said of the blacks dyed with the direct dyes especially those which have been developed up after dyeing. The following notes will perhaps be useful:—

(a) Soft, bright finish; this is got by mangling through soluble oil at 5 deg. Tw., drying on the tins, damping slightly, then calendering without much pressure, giving two or three nips. (b) Soft, dull finish. As above, only the calendering is much less, one nip without pressure being sufficient. (c) Crisp finish. For this, glucose liquor at 8 deg. Tw. is substituted for

soluble oil in above; bright or dull finish by varying the calendering. (d) Firm finish. For this either dextrine at 5 deg. Tw., or Epsom salts at 20 deg. Tw., may be used; calendering according as either bright or dull finish is required. Epsom salts gives weight as well as stiffness while dextrine gives stiffness only. The addition of a little Diamine Black RO or Benzo Black Blue will help to preserve the brightness and solidity of the blacks.

Dyed twills of various colors are often finished without any stiffening, as follows:—Mangle through warm water; if the cloths are delivered just as they come from the dyehouse this is omitted; they are then dried on the tins, dampened, stretched as much as possible, beetled from 30 to 40 minutes, both ends, calendered slightly on swizzing calender, generally twice, and then made up.

A more elaborate treatment is sometimes given. After the cloths have been beetled as above, they are run through starch mixing on two-bowl mangle, with the bottom bowl lapped with a strong domestic or linsey woolsey cloth; dried on tins, damped, calendered on three-bowl swizzing calender, twice through, first time one nip between two top bowls, second time two nips; the metal bowl being heated slightly; after which they are made up. Mixing:—starch at 12 deg. Tw., 50 gal.; white soap, softening, 3 lb. Dyed goods for the home trade are finished softer than those for foreign trade, and, as a rule, the cloths are of a much better quality.

Colored figured goods, such as spotted shirtings, brocades, damasks, are fininshed in the following manner:—Mangle through cold water on five-bowl water mangle, dry on tins, stiffen on two-bowl stiffening mangle with a little starch, dry quickly over the cylinder to raise the figure, damp slightly, calender on swizzing calender and make up. For some finishes, after calendering, the goods are stiffened on the back by running through two-bowl mangle with gum water at about 2 deg. Tw. Low qualities of these cloths which are shipped abroad are simply mangled, stiffened, dried on the cylinders and made up; in some cases they are slightly calendered before making up.

But for spotted goods the calendering and wetting out gives better and more satisfactory results.

—According to the late report of the Board of General Appraisers to the Secretary of the Treasury, undervaluation is an evil that is in process of ultimate extinction, notwithstanding the fact that there are now pending consignment cases involving very large, if not entire lines of merchandise, as in 1895, about which such wide differences of opinion regarding values exist as to render conflicting opinions unavoidable. It follows that the question of the adjustment of values in reappraisement cases is the most difficult one in which the Board is called upon to act.

Mercerizing Cotton Yarn.

Editor Textile World:

I always read with great interest your valued monthly review, and I may say that by adhering most strictly to the instructions contained in your October number respecting the mercerization of cotton yarns, I have been pretty successful in several experiments I have tried.

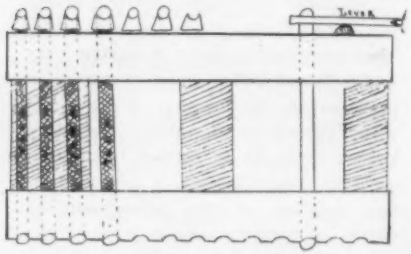
I say all this in answer to the statements of your correspondent (M. G. W., Mass., page 99, Nov. number), on the subject. I have not been wholly successful in obtaining the absolute appearance of silk which German dyers succeed in getting. This is due, perhaps, to their making use of very high counts, spun from Sea Island Cotton, and on special machinery, subjecting the yarn after that to some hot calendering process.

But, nevertheless, my personal experiments, based solely on your October number's recipe, are most interesting. First of all, I find that the affinity mercerized cotton has for all

dyes is simply marvelous. The fastness of the color to light, and the silky, brilliant reflection are also very noticeable. The feel is also softer.

But the shrinking seems never to be at an end, even after dyeing. I am sending you two small hanks, dyed in the same bath with Benzo purpurine 4 B; one mercerized, the other not, and of the same counts, 12's into 3 ends. There is no need of saying which is which.

For avoiding the shrinking I have got up the accompanying device:



The hanks are put onto two wrought iron tubes, the bottom one being secured, and the top tube raised as high as possible by the action of a lever; and when at its utmost height, well stretched, I place at both ends, under each extremity of the tube, a sort of loose pedestal, to keep the hanks well stretched. Both sides are equal, and the hanks are placed in the middle.

I then pull up, with a small hoist, the whole concern, and dip it into the solution of caustic soda.

The tubes have then to be turned round with a special handle so that the action of the caustic soda shall be equal for the whole hank, and, besides, if they were not turned, although totally immersed, the portion of the yarn against the tube would not be properly colored in the subsequent process. After 20 minutes, I raise the whole scaffold, if I may name it so, and dip it into an acid bath; afterwards into a clear water bath, and the hanks are then taken off the tubes, again rinsed and put through the acid bath over and over again.

I am sending you two hanks today, as I have said, to find out what you think of them.

My process may be of some use, or suggestive to your correspondent, or it might be improved, in a cheap way, without having to spend any money with high grade machinery, by some other of your experimenting subscribers on mercerization, and to the mutual benefit of all.

This apparatus I have referred to was made of wooden beams, but I am now making one from iron.

GUILLERMO DE BRUNET.

San Sebastian, Spain.

[The samples of hanks have been received. Ed.]

—One of the most important factors in the civilizing influences that have already been inaugurated in Cuba by the United States, is the opening of public schools in Santiago de Cuba, after the system in vogue in this country. The schools, it is expected, will be ready for four thousand children by the middle of this month. The salaries of the school commissioners have been fixed, the element of sectarianism has been eliminated, and everything is to be conducted after the American fashion. With this educational system carried throughout Cuba, there will be, in the course of a comparatively few years, a self-respecting population within the island, capable of realizing the benefits of a government dependent upon the free suffrage of the populace.

—In mills, print works and bleacheries where large amounts of cloth are dryed there is always a considerable amount of power used, and as a rule it is found to be of advantage to utilize the steam for generating the power before it is used for heating and drying.

—In weaving departments Southern help will manage successfully as many looms as in any cotton manufacturing country.

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Lug Straps.

Editor Textile World:

We are anxious to find out the name of a manufacturer that makes wrought iron lug straps. Can you advise us?

Georgia. C. B. S.

We have never heard of such a strap being made. Should any of our readers be able to furnish the necessary information, we should be glad to hear from them.

Work on Sizing.

Editor Textile World:

Can you recommend to me an up-to-date book on sizing?

N. H. X.

The best work on this subject, of recent date, and the one that is receiving large sales, is Monie's book on Sizing Ingredients, Size Mixing and Sizing, 63 pages, illustrated. Price $1. This work is referred to in our list of textile books published in our several monthly issues. It is intended to be a complete, practical work dealing with everything relating to the modern processes of sizing, and takes up such subjects as sizing ingredients (flours, softeners, deliquescent substances); Size preparations (Chloride of Zinc, Whitening material, Percentage of size, etc.); Fermentation; Mixing; Construction of Sizing Machine; Working of the Machine; Definition of Technical Terms; Calculation, etc. We have the book in stock, and can mail it immediately upon receiving the order, with remittance.

Hours of Labor.

Editor Textile World:

I noticed in your January issue some interesting mill statistics, concerning the industries of Connecticut. I refer especially to those relating to the hours of labor. Can you give me the hours of labor, and to whom they apply, in other States of the country?

Mass. G. W.

Our statistics applied only to the New England and Southern States, where cotton manufacturing is conducted, for the simple purpose of comparison. There are other States besides those mentioned in the table that we gave, which have factory provisions; for example, in California, the law restricts labor to sixty hours per week, to minors under eighteen years of age. In New Jersey, to 55 hours per week, to persons under eighteen, and women. In Indiana, no person under 16 and no woman under 18 can be employed in manufacturing establishments more than 60 hours per week. In Louisiana, the law is like that in California, so far as relates to time limitations, but applies also to women. In Maryland, the limitation is to 10 hours per day for all persons; but contracts may be made with male employes over the age of 21 to work for longer time. The law in Michigan and New York places the limit at 10 hours per day, or 60 per week, for males under 18 and females under 21, in manufacturing establishments. In North Dakota, the limit in factories is 10 hours per day for persons under 18; and no woman, whatever her age, shall be compelled, and no person under 14 permitted, to work more than 10 hours a day. This is the law in Oklahoma and South Dakota also. In Ohio, as to factories, the limit is to 10 hours per day, or 60 per week to persons under 18. In Pennsylvania a similar limitation applies to persons under 21, in textile and paper mills. In Virginia, the labor of women and children under 14 is limited to 10 hours per day; and in Wisconsin, persons under 18, and women cannot be compelled to work more than 8 hours per day. In addition to these, many of the States have limitations, if not entire prohibition, of the employment of children, generally having regard to their ability to read and write, or the amount of schooling they have received during the year. Possibly you do not care for these, or already have them, but I thought I would mention the points.

Productive Capacity of Cotton Machinery Since 1890.

Editor Textile World:

Has there been any increase in the productive capacity of cotton machinery since 1890?

Mass. J. B. B.

According to our best sources of information, there has been no perceptible increase in the productive capacity of cotton machinery in this country. The modern high speed spindles of the Rab

beth type began to be introduced about 1880, so that by 1890 they were generally in use, and there has been no improvement since to increase their production materially. The advance in spinning for the last eight years has been in perfecting details for convenience and also in the use of larger rings and longer traverse, so as to diminish the expense of doffing and spooling, and also to make less knots in the yarn. It is doubtful whether the speed of the spinning frame has materially increased during this time; in fact, in many cases where the larger rings have been adopted, it has been actually reduced in speed. Also on spoolers the speed in many cases has been reduced so as to make less strain on the yarn. In weaving, we believe there has been no average increase of speed; in fact, several mills that were trying high speed have gone back to the old style. The American idea in weaving is not so much to get production per loom, as production per weaver, as it is found that a weaver with a large number of slow running looms will do better than when trying less high speeded looms. The fact that looms are run so much faster in England is simply on account of their Trade Union laws, which restrict a weaver to a certain definite number of looms, so that the manufacturer is forced to make these few looms produce as much as possible. Of course, the introduction of the Northrop loom is having a material effect on weaving, but the makers have not endeavored to increase the production per loom by higher speed, but have rather made the machine more automatic, requiring less labor.

Printed Cloth for Stuffed Animals, Etc.

Editor Textile World:

Can you inform me where I can obtain cotton cloth printed with pictures on both sides, used for making stuffed animals, dolls, etc.?

Quebec. S. S.

The only place where this can be obtained is at the H. B. Claflin Company, New York. If this concern has none, it will be impossible to find what you want elsewhere.

Book on Cotton Carding.

Editor Textile World:

I wish that you would recommend to me the best book on cotton carding, with rules to find draft, twist of frames, etc.

Miss. A. B.

The leading books on this subject are as follows: "Cotton Spinning," by W. S. Taggart. Three volumes. $5.25. "The Student's Cotton Spinning," by Joseph Nasmith. $3.

Removing Burs from Wool, Etc.

Editor Textile World:

(1) Will you give me a recipe for removing burs, etc., from wool, while being scoured, or immediately after?

(2) In making white union blankets, we have occasionally found small holes in them, which have the appearance of being cut with a knife. Something seems to cut the warp and leave the filling all right. Can you think of any reason why this should occur?

(3) Which has the more felting properties, pulled wool or fleece wool? There is a difference of opinion here, and I ask you to decide.

Ontario. J. P. T.

The only recipe that can be given for removing burs and vegetable matter from wool is that applicable to the carbonizing of vegetable matter that is mixed with wool, in which sulphuric acid is the principal chemical used, in connection with a high degree of heat. This process is applicable to wool, after being scoured. In order to make any recipe of value, one should have the mechanical devices to go with it, which are rather expensive. Consult our advertising columns for parties that do this work, and those who make machinery for it.

In regard to the damage to blankets, we think it would be impossible for one to pass an opinion without seeing the goods themselves.

In regard to the felting properties of pulled and fleece wool, we should say that pulled wool, everything else being the same, would full more than fleece. Experience has so demonstrated. The use of depilatories for pulling wool has a tendency to increase the felting properties of the fibre.

As our correspondent intimates, there is a diversity of opinion in regard to the felting properties of pulled wool. One manufacturer, who has used a great deal of such wool in the manufacture of flannels, to whom we put this question, incidentally, says that he has found fleece wool fulls or felts better than pulled wool.

Latch Needle Manufacturers.

Editor Textile World:

Can you give us the names and addresses of latch needle manufacturers in Nashville, Tenn.?

H. E. P.

There are not, to our knowledge, any latch needle manufacturers in that city. If we are mistaken, we should be glad to be informed.

Book on Finishing.

Editor Textile World:

Do you know of a good book, or where I can obtain information, concerning the

finishing of woolen and worsted goods, made from wool and silk?

R. I. J. P. C.

We know of no good publication on this subject, as it is a very difficult one to write upon, as so much depends upon experience and judgment, which cannot be reduced to rules, the same as those relating to the other departments in the mill. General observations can, of course, be made how to finish woolen fabrics. There have been a number of articles published in the Woolen Department of this magazine, touching upon the different features of finishing woolens. A number of years ago, a very meritorious treatise was published by J. H. Greene, at a cost of 75 cents.

Machinery Wanted for Horse Blankets.

Editor Textile World:

I am desirous of manufacturing horse blankets by carding the wool and punching it into burlap, very much like the process described in your issue of last December. Will you let me know where I can obtain a punching machine, or where I can see one at work? I also want a fulling mill suitable for this class of goods.

J. S.

If any of our readers can furnish information that would be of value to our correspondent, we should be pleased to receive it. We would suggest that our advertisers that make fulling mills, etc., be corresponded with.

Electricity in the Card Room.

Editor Textile World:

In answer to B. L. N., Michigan, and C. F., Wisconsin, to avoid electricity in the card room, if they will try the following, there will be no further trouble. While no definite rule can be laid down for all cases, the following can be changed more or less to suit the particular circumstances. Keep in the picker room a barrel in which four ounces of alum (pulverized is better), to each gallon of water, is dissolved. Apply one gallon of this mixture to each one hundred pounds of stock. If this is not enough, add more alum. If the roping seems too dead, not life enough, use less alum. A little experimenting to hit just the right balance, will be necessary. I never knew the above to fail. The card room should not be kept uncomfortably warm while using the above.

George F. Maguire.

Mill Statistics.

Editor Textile World:

In your January issue, you have some Connecticut mill statistics, among which you mention tenement rents from 90 cents to $12 per month. Where are the rents as low as 90 cents per month?

N. Y. A. S. B.

It is quite supposable to have the rents as low as 90 cents per month, or even for nothing. Some mills do not charge anything for tenement rent. It is taken account of in the wages paid. However, we are obliged to refer our correspondent to the Bureau of Labor Statistics, Hartford, Conn., for an explanation of these figures.

New Publications.

"The Tradesman." The 20th annual of The Tradesman, published at Chattanooga, Tenn., came out last month, well patronized with advertisements and well filled with excellent reading matter, fully and handsomely illustrated, with scenes pertaining to Southern industries. The Tradesman is published on the 1st and 15th of each month, at a subscription rate of $2 per year.

Diamine Colors on Angola Yarn. This is the title of a color card issued by William J. Matheson & Co., New York. The properties of the individual dyestuffs and their relation to cotton and wool mixed goods are stated in another treatise, entitled "Diamine Colors on Cotton and Wool Mixed Goods," to which we call especial attention. In the samples of shades presented, the excellent properties of Diamine colors for dyeing mixed goods, are shown.

Knitting, Dyeing and Finishing Machinery. This is the title of a trade catalogue of 32 pages, issued by James Taylor, 825 Arch St., Philadelphia. The object of this catalogue is to bring before the public a line of machinery that, while very interesting from a mechanical standpoint, is doubly so from the manufacturer's financial standpoint. The catalogue illustrates and describes a great number of knitting machines, among them those suitable for family use. The machines described are built for various sizes and gauges of fabrics. We would suggest knitters writing for a copy of the catalogue.

Year Book for Colorists and Dyers. This is the title of Volume 1 for the year 1898, of which Harwood Huntington, New York, is the author. This book presents a review of the advances made in 1898, in bleaching, dyeing, printing and finishing textiles. It is in a portable form, and arranged to furnish quick information concerning matters of interest to the trade and those in the dye house. It is a precise recapitulation of the advances made in the especial field worked in by dyers and colorists. It is a vade mecum.

Sheldon's Buyers' Reference Book for 1899. New York. J. D. Sheldon & Company. Price $2. This book contains a classified list of cotton and woolen goods, with name and location of selling agents; also manufacturers' agents, and importers of silk and linen fabrics, notions and fancy goods. This book has a wide circulation, and is accepted as an authority.

Quarterly Journal of Economics. For January, 1899. Boston: Geo. H. Ellis. This Quarterly is published for Harv-

ard University, and is under the editorial care of Professors F. W. Taussig, C. F. Dunbar, William J. Ashley and Edward Cummings. The contents of this number consist of the following articles: The Preconceptions of Economic Science; A Collectivist Philosophy of Trade Unionism; Natural Divisions in Economic Theory; The United States Treasury in 1894-96; What Ought to be Called Money?

Pencilings. This is the title of a very handsomely gotten up catalogue of pencils manufactured by the Joseph Dixon Crucible Company, Jersey City, N. J. It is worth writing for as a souvenir and as a specimen of art. The pencils made by this company have a world-wide reputation, meeting with favor by all those who make use of them.

Calendar for 1899. Published by the Worcester Bleach and Dye Works, Worcester, Mass. This consists of a map of the United States, to be hung on the wall, and is a useful feature to any office.

Two-color Effects on Wool Piece Goods. This is the title of a color card, with recipes, showing a new method for producing two-color effects on wool piece goods, issued by Wm. J. Matheson & Company, New York. Until recently, multi-colored effects on wool piece goods have only been produced by the simple method of weaving together differently colored yarns. A new method is said to have been discovered, which, in a simple manner, gives, as described in this trade catalogue, much better results, and at the same time allows the production of especial weaving effects. This method consists in weaving chlored wool together with unchlored wool.

Glove Trade Directory. We have received from the publishers, Bame & Co., Gloversville, N. Y., the 1899 Directory of the Glove Trade, containing the names of glove manufacturers, including kid, leather and fabric, also sources of supply and leading department stores. The book is neat, compact and handily arranged for quick reference, and will be appreciated by those having to do with this industry.

Diamine Colors on Cotton, treated with Sulphate of Copper. This is the title of a color card issued by Wm. J. Matheson & Co., New York. Like all the color cards issued by this house, it is very attractively gotten up, which dyers should write for. There are 82 samples shown. Recipes showing their use are given.

Martial Black B. This is the title of a circular accompanying a color card, issued by Sykes & Street, 85 Water St., New York. This color is for wool, and is fast to light, air, acid and fulling. There is claimed for it exceptional advantages in the cost of dyeing, ease of application, etc. Recipes accompany the samples. We think dyers would be much interested in these samples, and would suggest writing to this concern for their circular.

The Ashland Valve Company, Boston, Mass., has issued for 1899, a steel engraved calendar, with two suggestive illustrations of children, entitled "Chips of the Old Block."

The Joseph Dixon Crucible Company, Jersey City, N. J., have issued an 1899 calendar, attractively illustrated in colors.

Diamine Colors on Worsted Yarn. This is the title of an elaborate color card issued by Wm. J. Matheson & Company, New York, showing shades fast to milling, dyed with Diamine colors on worsted yarn, together with methods of obtaining these shades.

Fall River and Its Manufactories. 1803-1898. This is the title of the 16th edition of a statistical publication, issued by Henry H. Earl, Fall River, Mass., containing matters referring to the cotton industry of that city, embracing dividends paid by local mills, production, number of spindles, list of officers, and other details pertaining to the manufacturing industry of that place.

Eight-Pole Motors and Generators. This is the title of Bulletin I, January, 1899, issued by the B. F. Sturtevant Company, Boston, Mass. These motors and generators are for independent operation, or for direct connection with the fan or engine, as illustrated and described in the bulletin.

Asbestos. This is the title of a descriptive price list relating to this substance, issued by the H. W. Johns Manufacturing Company, 100 William Street, New York, who are dealers in this commodity. Besides being a trade catalogue of 32 pages, it contains much valuable information that all users of steam should be particularly interested in. Asbestos is used in liquid paints, for all purposes where paint is used, giving the material upon which it is applied fire-proof and water-proof properties. It is also used for roofing, insulating felt, and steam pipe coverings, which latter is the principal use to which it is put. We would suggest writing for the catalogue.

Color Cards, published by Farbenfabriken of Elberfeld Company, New York. We have received from this concern some very handsome color cards, which dyers would find it to their advantage to write for. Samples and recipes are given, relating to the use of Wool Black N 4 B for wool; Phenol Blue Black 3 R, also for wool; Alizarine Blue S A P, also for wool; and Basic Colors discharged with Sulphite of Potash.

Electric Fans. This is the title of Bulletin H, issued by the B. F. Sturtevant Company, Boston, Mass., showing special types of electric fans, such as the pressure fan; bi-polar open fan; 4-pole open and enclosed fan; 4-pole circular frame open fan; and 8-pole circular frame open suspended fan. This bulletin illustrates and describes these different types. Fans delivering practically constant volumes are provided with starting rheostats; those which are variable in their delivery are equipped with regulating rheostats.

Mechanical Draft. Anyone desiring to know who uses the mechanical draft system should write to the B. F. Sturtevant Company, Boston, Mass., for their handsomely gotten-up catalogue,

giving a complete answer to this inquiry.

Manual of Lubrication. By Louis Simpson. Published by the author, Valleyfield, Quebec. This is a publication that appeared a number of years ago, at the time that the author was following manufacturing in England, but as we have a large stock on hand, we make notice of it in these columns, in the hopes that our readers will be sufficiently interested in it to order copies, at the greatly reduced price, 25 cents. The work is one devoted to lubrication, or how to choose and use lubricants for every description of machinery, with methods of determining the purity and other properties of oils. The authorship of the work is sufficient to give it authority. There are twelve chapters devoted to the subject, covering such topics as kinds of oil, adulterations and tests for the same; lubrication of steam engine cylinders and valves; oils for spinning machine; etc.

Machine Knives. This is the title of a very attractive catalogue of 32 pages, illustrated, issued by Loring Coes & Company, Worcester, Mass. This catalogue relates to all edged tools used in manufacturing, all of which are made by the most modern methods, and mechanical perfection is guaranteed. Great attention is given to the details of finish, interchangeability, accuracy and truth of surface, and especially to the uniformity of temper in the tools made by this concern, all of which is obtained by their pyro-calcic process, which enables the filling of any order from ten to ten thousand knives to a certain temper, so closely graded that no difference is discernible. This concern makes every class and shape of ledger or bed knives for woolen, cotton, and other textile work, and also furnish the shear strips for the revolving heads. They also make loom shears, yarn shears, sample cutter blades, and like goods, to 130 inches in length. As the perfect performance of this class of goods is a necessity for the successful working of the machines on which they are placed, too much stress cannot be laid on the quality of the stock used in them, in their absolute perfection of temper, which is warranted by this company. All of the stock used by this company is made from the best quality of cast steel, with the finest grades of Norway iron, or a specially imported Swedish soft steel, or a high grade Bessemer steel for backing. These are incorporated into one bar by welding, and are in the finished product a single piece. This company is ready to weld any tool steel to such shapes as are needed by their customers. This company give illustrations in their catalogue of such articles as planer knives, wood working knives, rag, bark and chipper knives, leather splitter knives, paper knives, and all edged tools used in textile manufacturing, etc.

Industrial News.

—The name of the Victoria Iron Works of Somerville, Mass., has been changed to the Somerville Machine Works, Albert Birch, sole proprietor. Mr. Albert Birch has recently issued a circular explaining that he had re-christened his works, as above, so as to avoid confusion with the business of his brother and former partner, Arthur Birch, who is in no way connected with the Somerville Machine Works at the present time.

—The Howard & Bullough American Machine Company, Pawtucket, R. I., have received a repeat order for electric stop motion drawing frames, from the Grosvenor Dale Company, No. Grosvenor Dale, Conn.; also, a large repeat order for speeders, from the Piedmont Manufacturing Company, Piedmont, S. C., which has also given an order for 3,000 spinning spindles. In addition to these, this company has other large repeat orders recently received, besides having in hand several contracts for complete equipments of machinery, including picking cards, drawing, speeders, spinning and cone winders, from the new Marie Mills, McColl, S. C., and others. The company have received another order for revolving flat cards, from the Albion Company, Valley Falls, R. I., who are making extensive alterations in their mills. The Howard & Bullough American Machine Company are very busy with orders for cotton machinery, both for the South and North.

—The Berlin Iron Bridge Company, East Berlin, Conn., are furnishing the steel work that is entering into the construction of a new plant consisting of generating house, boiler and engine house, for the United Gas Improvement Company, Gloversville, N. Y. This company is also furnishing and erecting the steel work that is used in the construction of a new church, known as the Pawtucketville Church, Lowell, Mass. Over the interior auditorium of this church will be placed heavy steel trusses, having a clear span supporting the roof, frame and ceiling.

—The Merchants' Sample Card Company, represented by Alfred S. Hatheway, are now located at 255 Centre Street, S. W. Corner Broome Street, New York City.

—In our January issue, in the article referring to Glugloss Gelatine, manufactured by the Quaker City Chemical Company, a typographical error occurred in locating this company at Fort Wayne, Pa., instead of Wayne Junction, Penn.

Opened a Boston Office.

Owing to the large increase in the New England business of the Mitchell-Bissell Company, of New York and Philadelphia, they have deemed it advisable to open a New England office, so that they may be more directly in touch with their customers in this section. Their Boston office will be at 170 Summer St., Wentworth Building, and will be in charge of J. R. Mitchell. This concern makes a specialty of porcelain and enameled guides, made in all forms and varieties, to suit the requirements of textile manufacturers. The advantages of porcelain or enameled wearing surfaces for yarn and thread guides are becoming more and more recognized by manufacturers in all branches of the industry, and has resulted in the constant growth of their business.

Electrical Power Work.

In view of the extent to which electricity is now being employed in power service, we are confident that owners and managers of mills and factories will be glad to know of an engineer thoroughly conversant with the conditions

of mill work, whom they can consult as to the distribution of power by this method. W. S. Kelley, whose card appears in this issue, has, since engaged in mill engineering, had ten years' experience as engineer and special agent with the largest electrical companies, during which time he has given his time almost exclusively to applications of electric power. He is equally familiar with continuous and alternating current machinery and methods. Many of the readers of the Textile World will remember Mr. Kelley as its first editor (at the time engaged in mill engineering in Lowell) and as a leading contributor to the textile trade journals, when previously employed as an overseer.

Mr. Kelley is particularly well qualified to advise on the use of electric power in mills, owing to his long experience in, and thorough knowledge of, the conditions prevailing in textile manufacturing. We cordially commend his services to any contemplating the use of electric power.

Dye Sticks.

We mentioned in our January issue that Frank Bailey, Cedar Brook, Camden Co., N. J., makes all of his dye sticks from natural white swamp cedar. This was not altogether correct. Mr. Bailey does not make all of his sticks from this material. He makes kettle sticks, dry and sulphur house poles, also sticks to suit the Wolstenholm machine from natural water-grown cedar. He also makes sticks to suit the Klauder-Weldon, and Lorimer machines from finer grades of lumber. These sticks have been thoroughly tested, and are guaranteed to give satisfaction to dyers.

Drying Machinery.

In the many operations lying between the preparation of the raw material and the finishing of the final product, probably none has given the manufacturer more food for thought or left more room for improvement than the ordinarily simple process of drying. What was good enough for our ancestors is found sadly wanting in these days of close competition and methods have to be employed which commend themselves for convenience of handling, and greater economy of operation.

The combining of several processes during the operation of drying, as, for instance the removal of grit, sand and dirt from cotton stock during its passage through an automatic continuous dryer, or the continuous drying and carbonizing of wool, rags or noils in one operation, are features that interest every up-to-date manufacturer.

The proper blending and mixing of the colors and also the gradual grading of the temperature from a high temperature at the feed end to a low temperature at the point of discharge, also tend to improve the stock and give a better feeling to the dried product.

In the drying of yarns and other materials, the main points of the preceding remarks about the benefits of grading the temperature hold good along with other economical features used in connection with this class of work, and following along these lines. Few have given the subject closer study than the members of the Philadelphia Drying Machinery Co., whose advertisement appears among the manufacturers of this class of machinery.

As individuals Wm. Miller, Thomas Allsop and Walter W. Sibson have been connected with the Phila. Textile Machinery Co., for a number of years and their general acquaintance among the manufacturers and the fact that they are all practical men, is sufficient guarantee that their business will be conducted in an energetic and thoroughly satisfactory manner.

—William Strange, president of the William Strange Co. of Paterson, N. J., and vice-president of the Silk Association of America for many years, succeeding his father, Albert B. Strange, died recently in his 61st year. His business reputation was unexcelled. He was distinguished for his fairness in all his dealings, and was highly appreciated by his employees in the mills as a liberal employer.

—The Akron Chemical Company, 8 Doane St., Boston, Mass., is a new concern dealing in dyewood extracts, aniline dyes, and mill supplies, and actively represented by D. W. Dempsey and W. H. Wilder, Jr. This representation would seemingly assure for the company a favorable reception among manufacturers who are wanting dyeing materials.

—William C. Lesher, formerly Philadelphia representative of James S. Kirk & Co., is with the firm of O. S. Janney & Co., importers of dyestuffs and chemicals as salesman.

—Pennsylvania, Reynoldsville. The roof of the Reynoldsville Silk Mill was blown off during the heavy storm of January 14, and a part of the brick walls demolished. The mill was running at the time, it being 2 o'clock in the afternoon, but fortunately no one was injured. Damage to the building is estimated at $10,000, and to machinery and goods, $1500.

—Rhode Island, Woonsocket. Beginning February 1, the Social Mfg. Co. will operate the Nourse Mill both night and day, employing two sets of operatives.

—South Carolina, Charleston. Court has ordered the sale of the Charleston Cotton Mill by receiver C. O. Witte as a going concern.

—*South Carolina, Chester. The court has now fixed an upset price of $25,000 on the Chester Cotton Mills, which will be again offered for sale some time in February. Special Master J. E. Hagood will advertise the property for sale.

—*Tennessee, Memphis. We learn that the Memphis Cotton Mills Co. is simply a new company which has acquired the Old Bluff City Cotton Mill. The property was bought by the bondholders, and is now idle and for sale.

—Wisconsin, Superior. We note a rumor that a woolen mill may be built at this place to make goods especially for a large Scandinavian population in this state and Minnesota. The projector is Morris Nilsson, a manufacturer of Norway, who is at present in Minneapolis with the idea of locating a mill. He proposes to build a $100,000 plant. He has also been in Minnesota where we have reported his project before.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Enterprise. Ed. M. Johnson, who is interested in the proposed new cotton mill here, informs us that the permanent organization of the company has not yet been perfected, but they hope to get acharter before the end of this month, when we shall be able to give further particulars.

—Connecticut, Hebron. A mill to manufacture cotton twines and yarns will be started at Grayville by Ottenheimer Bros. of Willimantic.

—*Georgia, Calhoun. In reference to the cotton mill proposed for this place, it seems that no definite steps have yet been taken. J. B. F. Harrell is anxious that the mill should be built here and offers to give 25 acres of land.

—Georgia, Juliette. Dr. W. P. Glover, who owns a valuable water power on the Ocmulgee River, talks of building a small yarn mill costing about $20,000.

—*Georgia, Lindale. The Massachusetts Mills in Georgia have their addition well under way. This will contain 20,000 spindles, giving them a total of 50,000.

—*Georgia, Macon. W. S. Payne, recently mentioned as interested in a proposed new cotton mill at this place, informs us that he expects to build a plant immediately to be run by steam power, the product to be coarse yarns. None of the particulars are as yet decided, and equipment has not been contracted for.

—*Georgia, Rockmart. W. S. Walcott, president of the New York Mills, informs us that their new mill at this place will probably not start production until January, 1900. The foundations will be started next March. The mill will have 450 looms, will use steam power, have a dye house and make wide sheetings and colored goods.

—Louisiana, New Orleans. Joseph McCarron & Sons, 708 Valence St., are getting information regarding proposed new cotton twine mill to be established here.

—Louisiana, Shreveport. The erection of a cotton mill is being talked of here, and the names of H. H. Hargrove and John W. Taber are mentioned as interested.

—Mexico, Torreon. The La Fe Cotton Factory, under the management of Jose Farjas, is now nearing completion. Capital stock is $600,000, and the mill will have about 500 looms.

—North Carolina, Albermarle. The new Wiscasset Mills, which expected to start up with 12,000 spindles, have now decided to increase this number by 3,000 spindles, making a total of 15,000. Machinery has been ordered.

—*North Carolina, Gastonia. A new mill will be built by the Modena Cotton Mills, which will be a duplicate of their present plant. $40,000 of new stock will be issued, and it is understood that this stock has already been over subscribed by the present stockholders. This enlargement was talked of about a year ago.

—*North Carolina, Gastonia. The new cotton mill company at this place, to be called the Ozork Mills, will have a capital of $125,000. President is George A. Gray; vice-president, J. F. Love; treasurer, R. P. Rankin. Work on their new building will be started in April, but it is not expected that the plant will be operated before October, 1899. Their product will be fine yarns, warps and skeins. They will have 5000 spindles.

—North Carolina, Mocksville. We understand that Ladshaw & Ladshaw, civil engineers of Spartanburg, S. C., have prepared plans and specifications for a 25,000 spindle mill at this place, which is on the South Yadkin River. Geo. A. Mebane, of Spray, N. C., is said to be at the head of this enterprise.

—*North Carolina, Norwood. The Norwood Mfg. Co. recently started up 4000 of its new spindles, and it is expected that the balance of 1000 spindles will be started very soon. Louis Guion is superintendent.

—North Carolina, Rock Hill. The Highland Park Mfg. Co., of Charlotte, N. C., owns the old Standard Mill at this place, which has 486 looms. This company now proposes to put up a spinning mill of 7,000 spindles to be operated in connection with the weaving plant. The mill will be under the same management as the Charlotte mill, of which W. E. Holt is president, C. W. Johnson, treasurer and J. H. Brannon superintendent.

—*North Carolina, Roxboro. Regarding the proposed new cotton mill here, J. A. Long informs us that they are making an effort to build a 5000 spinning mill. They have no organization as yet, the stock having not been all subscribed, but he believes it will be before long. Estimated cost of the plant is $70,000. At present, Northern capital has not been solicited.

—*Pennsylvania, Philadelphia. E. Holden & Co. have decided to build a new building on the corner of Magaret and Ditman Sts., Frankford. They are at present located corner of Othordox and Race Sts., Frankford. Foundations for the new building were started January 16, and they expect to have the plant ready to start May 1, 1899. Their product is fancy damask, centre covers, derby cloth and curtains. They expect to put in 50 new looms; use steam power, have a dye house and employ about 60 hands. They sell their product direct.

—Rhode Island, Central Falls. We understand that the Charlton Mfg. Co., of

Pawtucket, has leased a building of the United States Cotton Co., and will equip same for manufacturing corduroy.

—*South Carolina, McColl. Work has been started on the building for the Marie Cotton Mfg. Co. The equipment will be 5000 spindles, which have been ordered of the Howard & Bullough American Machine Co. The product will be colored hosiery yarns.

—*South Carolina, Spartanburg. The Tyger River Cotton Mills, of which J. R. Gress is president, and B. F. Brown secretary and treasurer, and which we reported as incorporated last week, proposes to develop a water power here and erect a cotton mill. Capital stock to be about $100,000.

—*Texas, Barker. The Meadowbrook Mills Co. has been chartered to manufacture cotton and woolen fabric at this place. Capital stock, $300,000. Incorporators: O. T. Holt, B. F. Smith and Frank W. Smith. This is the company promoted by Chicago men that first proposed to locate at Webster, Texas. Barker is a station on the Missouri, Kansas & Texas R. R. about 18 miles from Houston. The mill will have 10,000 spindles. 16,000 acres of land have been purchased to be laid out in small fruit farms and town lots. We think the machinery will be that formerly in the Allegheny Mills at Pittsburg which has been stored somewhere in Illinois.

Enlargements and Improvements.

—Georgia, LaGrange. At the recent stockholders' meeting of the Dixie Cotton Mills, it was decided to buy some new machinery and build a large warehouse soon. Officers were elected as follows: Hugh A. Dunson, president, and N. R. Hutchinson, secretary.

—*Georgia, Poulan. The addition to the Aberdeen Mills, which will provide for 6000 spindles and 180 looms, is now nearing completion, and it is expected that machinery will be ready to start up within 90 days.

—Indiana, Indianapolis. Love Brothers, proprietors of the Indiana Warp Mills, now propose to double the capacity of their plant. They have at present 500 looms. Work on the new building will be started very soon.

—Massachusetts, Chicopee. The Dwight Mfg. Co. are putting in 100 new Whitin looms in mill No. 7.

—Massachusetts, Fall River. The Parker Mills will enlarge their weaving department, and put in about 60 new looms.

—*New Hampshire, Manchester. H. F. Straw, agent of the Amoskeag Co., states that mill No. 4 will be built over, and it is very likely that mill No. 5 will also be replaced by a new structure, or, it is even possible that one large new mill will be erected to replace both No. 4 and No. 5. It is not probable that the change will result in any increase in the number employed.

—North Carolina, Charlotte. 4000 new spindles may be added to the present equipment of the Louise Cotton Mill.

—North Carolina, Cumberland. The Eastern Building & Loan Association of Syracuse, N. Y., which recently bought the Cumberland Mills at this place, will put in 3000 to 3500 new spindles. The mills at present have 3200 spindles and 90 looms. C. H. Reynolds is manager of the plant, and it is expected that it will be started in a few weeks.

—North Carolina, Hillsboro. We are informed by the Eno Cotton Mills that their enlargement consists of 4160 new spindles, which they expect to have running by the first of April. This will give them a total of 10,000 spinning and 5000 twisting spindles. They have been running nights with two sets of help. The night operatives will be employed on day work on the new machinery. Their product is 2-ply yarns, 20s to 30s, warps and skeins.

—*North Carolina, Waxhaw. The Rodman-Heath Cotton Mills, which were started up November 1, 1898, confirm our report that they are to add about 2500 new spindles. Their product is yarns 24 2-ply to 40 2-ply. At present they employ 40 to 50 hands; use steam power. Their capital stock is $100,000, of which $57,000 has already been paid in. The officers are: President and treasurer, J. L. Rodman; vice-president, E. J. Heath; superintendent, R. Nutall. Product is sold by W. M. & F. W. Sharples, Philadelphia.

—*South Carolina, Fountain Inn. The Fountain Inn Mfg. Co. is now putting in its new machinery, which consists of over 3000 new spindles. It is expected that the plant will be running by February 1.

—*South Carolina, Lancaster. The Eureka Cotton Mill, located at Chester, but with postoffice address at Lancaster, informs us that they have already added 5000 new spindles, and expect to start up their plant January 15. The capital will shortly be increased to $150,000. It is at present $60,000. They have also built four new warehouses for storing cotton, with a capacity of 8000 bales. Their product is largely hosiery yarns.

—South Carolina, Piedmont. The Piedmont Mfg. Co. has ordered 3000 new spindles.

—South Carolina, Sumter. At the stockholders' meeting of the Sumter Cotton Mill, the purchase of new machinery was considered, but the matter was left to the directors with power to act, and it is stated that new machinery will probably be purchased during the coming year out of the profits of the mill, which has been very successful since its reorganization in 1896.

—South Carolina, Yorkville. The York Cotton Mills are to build a brick addition to their main building.

—*Virginia, Lynchburg. The stockholders of the Lynchburg Cotton Mill Company are again considering the subject of an enlargement, and it is expected that the capacity of the plant will be doubled soon.

Mills Starting Up.

—Connecticut, Turnerville. John J. Ottenheimer has started a mill here for the manufacture of twine and cordage, to be known as the Connecticut Twine and Cordage Manufactory, with a capacity of about 3500 pounds of twine per week. It will also manufacture cordage. The mill

is equipped with machinery. No new buildings will be erected at present.

—Georgia, Forsyth. The Forsyth Mfg. Co. is now starting up its new mill. Their equipment is 5804 spindles, and they will make carpet warps and hosiery yarns. J. M. Ponder is president and J. H. Kane superintendent.

—Massachusetts, Millbury. It is reported that the Wheeler Cotton Mill, owned by S. E. Hull, A. C. Winter and T. A. Windle, has been sold to the Union Linen Co. of Portland, Me. This company is said to own a patent process for bleaching flax for making linen cloth. Some necessary repairs will be undertaken at once.

—Massachusetts, Millbury. The Millbury Cotton Mills started up January 16 and will be busy for two months running out stock on hand, after which it is expected that the plant will be shut down indefinitely.

—Massachusetts, West Warren. The Warren Cotton Mills have started 100 looms in mill No. 1, and are getting more looms in shape to start soon. Mill No. 2 is undergoing repairs. Mill No. 3 is running on carding and spinning. Mill No. 4 has not been started yet, and nothing has been done in the way of repairs. C. H. Hobbs is the agent, and George A. Moody superintendent. Their product is sold by Bliss-Fabyan & Co. of New York and Boston.

—*North Carolina, Concord. The new cotton mill of Leppards & Shealy Mfg. Co. is about to start up. Most of the machinery was bought as secondhand from Northern mills, but it is in first-class condition. The power equipment is entirely new. This is a spinning mill of 4000 spindles. Capital stock of the company is $50,000.

—Texas, Sherman. It is likely that the Sherman Bag Factory will be put in operation by Charles Andrews, who has an option on the property. The mill has been idle for two years.

—*Virginia, Manchester. The United Cotton Mills is the name of the new corporation, with a capital of $10,000. The incorporators are A. J. Bradley, A. F. Merissett, N. B. Bradley, of Manchester, A. Moorhouse, Darien, Conn., C. M. Woodford, New York, and A. W. Patterson, Richmond, Va. We suppose this is the company which is to operate the Marshall and the Old Dominion mills, mentioned alst month.

—*Virginia, Petersburg. The Swift Creek Cotton Mills, recently sold, will be put in operation about the last of February by the Quinn Mfg. Co. The president of this company is M. W. Quinn, agent of the Hamilton Woolen Co., Amesbury, Mass. Treasurer and agent is F. J. Quinn. Product of the mill will be sold by Richard A. Blythe of Philadelphia. It will be equipped with 5000 spindles, and make hosiery yarns and sheetings, employing about 125 hands. The plant has both steam and water power, with 150 40" looms. Capital stock will probably be $50,000. There is no dye house.

Mills Shutting Down.

—Connecticut, Danielson. The Danielson Cotton Co. has run out stock at its mill and closed the plant indefinitely.

Woolen.

New Mills.

—*Pennsylvania, Troy. The Northern Woolen Mfg. Co. is the name of a new concern here, of which C. J. Marble is president, J. Carleton Marble treasurer, and Frank F. Marble secretary. Their new building is completed and machinery will be set up very soon. Seven carloads have already arrived and more is expected. This machinery came from the woolen mill at Owego, N. Y. They will have two sets of cards, 11 looms; use steam power. There will also be 15 knitting machines and a dye house, and they will employ about 60 hands. They expect to start up February 1, and will make cottonades, wool shirts and pants, overalls, hosiery, yarn and wool bats.

—Pennsylvania, York. It is reported that Randle & Diehl, of York, will manufacture rag and jute carpets in the village of Mount Wolf. Their plant will be ready to start about April 1.

—*Virginia, Snowville. T. C. Newby is equipping a mill at this place, which will be known as the Snowville Woolen Mfg. Co. It will have two sets and twelve looms. Capital stock will be $10,000. They will make skirts, blankets, cassimeres and flannels, employing 25 hands and using water power. He formerly operated a mill at Bakersville, O., and now has associated with him A. G. Slenker.

Enlargements and Improvements.

—Connecticut, Norwich. New machinery, including 54 looms, has been put into the Clinton Woolen Mill.

—Indiana, Evansville. The Evansville Woolen Mills are shut down temporarily while new machinery for making cassimeres is being put in.

—Maine, Hartland. It is understood that the Linn Woolen Co. has purchased machinery from Halifax Mill at Lakeport, N. H., and is preparing to ship same to Hartland, where it will be installed in a new mill of this company.

—Massachusetts, Clinton. The old Counterpane Mill is being remodelled for the Clinton Worsted Company. The pitch roof will be removed and another story added, making it four stories.

—*Massachusetts, Norton. The Morse Wool Treating Co., whose plant was damaged by fire last month, are making necessary repairs. This plant was started up last November with equipment for cleaning wool. The company has a capital of $500,000. President, Augustus Clason of New York; treasurer and agent, J. T. Morse. New York office of the company is at 23 Doane St. They use both steam and water power. They are increasing and building all the time.

—New Hampshire, Dover. At the Cocheco Mills repairs and changes are being made to mill No. 4. A new elevator will be put in.

—North Carolina, Elkin. The woolen mills of the Chatham Mfg. Co., owned by Gwyn & Chatham, will be enlarged to double their present capacity within the next three months. Their main building, which is 200 by 77, will have another story added. At present the mills have three sets of cards, 26 looms and make blankets.

—Pennsylvania, Bristol. The addition to the worsted yarn mill of W. H. Grundy & Co., at this place, will be 60 by 300, two stories, brick and iron. Contract has been awarded to John De Groot of Bristol by Archt. Seymour Davis, 907 Walnut St., Philadelphia. Grundy & Co. have an office at 108 South Front St., Philadelphia.

—*Pennsylvania, Philadelphia. Plans for the new buildings of E. Holden & Co., to be located at the corner of Margaret and Ditman Sts., Frankford, are now ready for figuring. The architect is Harry C. Mann.

—Pennsylvania, Philadelphia. Architects J. F. Stuckert & Son, 49 North 13th St., Philadelphia, are making plans for a large addition to the picker house of William Ayres & Son at Third and Cumberland Sts. The building will be of brick and iron, three stories and basement, 35 by 176.

—Pennsylvania, Philadelphia. Rudolph Blankenburg & Co., woolen and cotton yarn manufacturers of 617 Chestnut St., will build a large addition and make extensive alterations to their present plant.

—Virginia, Buena Vista. The Buena Vista Woolen Mills have put in new looms, and will probably build an addition to accommodate other machinery.

Mills Starting Up.

—Maine, North Berwick. The North Berwick Woolen Co. started up its plant January 2, after a shutdown of about three months.

—*Massachusetts, Clinton. The Bigelow Carpet Co., whose woolen mill was shut down December 17, have now started up this plant.

—Massachusetts, East Brookfield. The Mann & Stevens Woolen Company is expected to soon start up on full time, as they are reported to have received large orders. The shoddy mill has already been started.

—*Massachusetts, Millbury. The Bowden Felt Mills Co., about to start up their plant here, has a capital of $50,000, the plant being estimated at $40,000, and $10,000 in cash. President is John R. Farnham, president of the Davis & Farnham Mfg. Co., Waltham, Mass.; treasurer, H. L. Bowden, 18 High St., Boston; superintendent, M. A. Robinson.

—Massachusetts, Warren. The Sayles & Jenks Mfg. Co., whose mill has been idle since November, has just started a few hands on samples.

—New Jersey, Naughright. J. C. Batson is equipping a building here for manufacturing shoddy. He will have three sets and two pickers, and will be ready by March 1 to do picking, carbonizing and combing wool stock. He expects to sell direct.

—Pennsylvania, Philadelphia. J. R. Keim & Co., proprietors of the Shaxamaxon Worsted Mill, 515 Market St., are now moving machinery to their new mill on Allegheny Ave. and Palethorpe St. It is expected that the new mill will be ready to start up March 1st.

Mills Shutting Down.

—Kentucky, Louisville. The Eclipse Woolen Mills closed down last month, and it is understood that the firm of W. H. Barrett & Co., proprietors, will go into liquidation. The mill will probably be sold. The price asked is said to be $240,000. This is the oldest jean mill in Louisville. The reason for this step is that one of the firm desires to retire from active business.

—New York, Dryden. The Dryden Woolen Mill has been shut down. This plant has been operated for C. W. Tompkins, of New York, since the Dodge Co.'s assignment.

—Ohio, Tiffin. The Tiffin Woolen Mills, six sets, has been shut down pending the sale of the plant and settlement of the estate of the late Samuel S. Meyers. About 75 hands are thrown out of employment.

—Pennsylvania, Indiana. The Indiana Woolen Mills, a one set plant, has been closed down. It is probable that it will not start before two months. Repairs will be made.

Knit.

New Mills.

—*Massachusetts, Pittsfield. An effort is being made to encourage the establishment of a small knitting plant by J. H. Musgrove and his brother, C. M. Musgrove. As yet nothing definite has been settled. The citizens are desirous that the Musgroves should remain here and continue the knitting business on their own account. Mr. J. H. Musgrove has been superintendent of Collins mill for many years.

—New Jersey, Jersey City. C. H. N. Zimmerman & Son Co. has been incorporated here, with a capital of $50,000, to manufacture knit goods. Principal office, 48 Tuers Ave., Jersey City. Incorporators: John Wiedman, A. Sonderhof, 79 Walker St., New York; Alfred Schmidt, Hoboken; John Schmidt, Jersey City. This concern originally started to locate at Brooklyn, and we have reported it under that head.

—New York, Nyack. The Nyack Knitting Co. has been incorporated. Directors of the company are: W. H. Brayton, Frederick H. Brayton and Eugene F. Perry. The company will occupy the second floor of the Joyce Factory, and it is expected that the plant will be started up by February 1, making women's ribbed underwear. W. H. Brayton has for six years been superintendent of the Plainfield Mfg. Co., Plainfield, Conn. The capacity of the plant will be about 75 dozen per day. John H. Ballis, of Philadelphia, is the superintendent.

—*North Carolina, Weldon. The officers of the new Weldon Cotton Manufacturing Company have been elected, as follows: W. T. Shaw, president; W. A. Pierce, secretary and treasurer; M. A. Smith, general manager. The plans and specifications are ready to figure, and bids will be received very soon on their new mill. This plant will be equipped with knitting machinery for the production of 200 dozen pairs of hosiery and 200 dozen shirts per day. It is expected that spinning machinery will be put in later. This company has a capital stock of $25,000.

—*Ohio, Elyria. The Fay Stocking Co., which we last reported was having diffi-

culty in securing a plant here, has now secured a part of the Elyria Canning Co., which will be refitted as a knitting mill.

—Ohio, Piqua. A new company has been chartered here, called the Piqua Underwear Company, capital $25,000. John M. Cahill, Edgar A. Todd, C. Langdon, M. G. Smith, and A. J. Hemsteger are interested.

—Pennsylvania, Thompsontown. A new hosiery factory will be started here, by A. W. Grubb and A. H. Long. It will only employ about ten hands at the start.

—*Pennsylvania, Upper Black Eddy. It is expected that the new plant known as the Hero Knitting Mill will be started up very soon, as new machinery is now being put in, and the yarn is on hand. Thomas P. Ellowhead is manager. It is reported that orders from a New York firm sufficient to keep the mill running for two years or more, have been received. About 40 hands will be employed.

—Rhode Island, Woonsocket. The Woonsocket Knitting Co. is a new concern which has an establishment in the rear of the Reporter office building, where they operate eight new knitting machines. The proprietors are J. A. Tougas, H. F. Poitras and Adelard Archambault.

—*Rhode Island, Woonsocket. The Morrill Knitting Co. has now decided to locate its new plant at 297 North Main St., where they have a two-story brick building, which is now being fitted up for them. It was at first thought that they would be located in the mill of the Woonsocket Shuttle Co. The plant will probably be in operation in about six weeks. Frank A. Morrill is manager.

—*Vermont, Brattleboro. L. A. Gregg, manager of the Electric Hosiery Co., informed us that he expects to start his new mill January 16 with seven knitting machines, employing twenty hands on children's and misses' worsted hose. He will use electric power. He is in the market for No. 28 single worsted yarn.

—*Virginia, Lynchburg. J. G. Burton, of Providence, R. I., will be manager of the new Midland Hosiery Co., recently mentioned. A factory building, formerly used for the manufacture of shoes, has been secured, and it is expected that start will be made very soon.

Enlargements and Improvements.

—Pennsylvania, Reading. We are informed that the Reading Knitting Mills, Reading, Pa., have ordered of Paxton & O'Neill, 105 three-quarter automatic machines for half hose, and expect to put in as many more later. This order was erroneously reported last spring to have been given for Scott & Williams seven-eighths automatics.

—Connecticut, Derby. A. H. & C. B. Alling are installing new machinery and making improvements to their knitting mill here.

—Connecticut, Winsted. The New England Knitting Co. has had plans prepared by Architect E. E. Benedict of Waterbury, for the extension of their plant on Main St. It is thought that iron trusses will span the river and on these a three-story building erected, about 40 by 70.

—*Connecticut, Winsted. The addition to the plant of the Winsted Hosiery Co. is now nearing completion, and machinery will soon be put in.

—Massachusetts, Boston. A Southern mill wants to buy the following machinery in good condition: Union special, twin needle, flat bed for sewing edging also overseaming; Singer finishing or U. S. finishing machines for ribbed underwear. Letters addressed to "U. 176" care of Textile World will be forwarded.

—*Michigan, Grand Rapids. The Star Knitting Works confirm our recent report that an addition is to be built to their plant, but at present they cannot give full particulars. Their product is ladies', misses', and children's ribbed underwear.

—*New Hampshire, Lakeport. P. Bartlett & Son, of Milford, N. H., have bought most of the knitting machinery in the old Halifax Mills, and they will remove same to Milford. The mill will be dismantled.

—*New York, Green Island. Isaac Roff, proprietor of the Green Island Knitting Mills, confirms our recent report regarding his addition, and states that he expects to have it completed about March 1. His product is high grade cotton ribbed, fleece-lined and balbriggan underwear.

—*North Carolina, Charlotte. The Gold Crown Hosiery & Knitting Co., R. M. Oates proprietor, is having its new spinning machinery put into the addition recently built.

—*Pennsylvania, Manheim. The new machinery which S. M. Long, proprietor of the Manheim Hosiery Mill has purchased, will give him an equipment of sixteen 7/8 automatic, six 15/16 automatic and fourteen hand knitters. Six of these machines are new. He will employ 22 hands, and is running on full time making government goods.

Mills Starting Up.

—New Hampshire, Ashland. The Ashland Knitting Co.'s plant, which has been shut down since the middle of September, has again started up.

—New Hampshire, Laconia. The hosiery mill of the Hodgson & Holt Co., which has been shut down for about three months, will probably be started up very soon.

—*New Hampshire, Lakeport. H. H. Wood & Co. inform us that the Halifax Mill, which they have leased, will be run in connection with the Oriental Mill, which they are now operating. The Halifax Mill will be started up February 15 on wool hosiery, employing 100 hands. This is a four-set plant; uses water power; has 1100 cotton spindles. 75 new knitting machines will be put in. They have a dye house. George W. Cole is superintendent. The product will be sold direct.

—*New York, Arcade. The Fashion Knitting Mill of John C. Sanford, which is a new plant, was started up January 9.

—New York, Amsterdam. The Van Brocklin & Stover Co., proprietors of the

Montgomery Knitting Mill, has leased the Clermont Mill and will put it in operation by February 1, employing about 120 hands. This plant has been idle for a long time.

—*New York, Greenwich. The Pleasant Vale Mill was started up January 3 by Edwin Groat, formerly of Hudson, N. Y. Ten double knitting frames will be added to the twelve already in the mill, and other machinery put in. Employment will be furnished to about 125 hands. Mr. Groat has a lease of this plant for five years.

Silk.

New Mills.

—Connecticut, New London. W. A. Oothout & Son, of Newark, N. J., have leased the Oneco Bldg., on Water St., and will establish a plant for making drapery silks. Machinery will be shipped at once, and it is expected that the plant will be in operation within a month.

—*Massachusetts, Boston. Louis B. Magid, president of the Magid-Hope Silk Mfg. Co., whose office is at present 85 Water St., Boston, informs us that the location of their new plant has not been decided upon. Newburyport, Woonsocket and several other places have been considered. He states that foreign machinery has been contracted for to the amount of about $100,000, and an equal amount from manufacturers here. He states that the capital stock has been increased, during the last month, from $300,000 to $500,000.

—*New Jersey, Paterson. We hear from R. Krause & Son, 215 Greene St., New York, that their silk ribbon plant, mentioned last week, is at present a very small affair, which they started a year ago in New York as an experiment, and are now transferring to the Harding Mill for the present.

—Pennsylvania, Athens. The Tioga Silk Co. has been incorporated under New Jersey laws. The incorporators are Edwin J. Becker, Alphonse A. Cardinal and Frederick W. Becker, each holding 133⅓ shares of the 400 issued. The capital stock is $40,000 all paid up. The above parties are of the firm of Cardinal & Becker, 26 and 28 Fulton St., Paterson, and we understand that the firm of Cardinal & Becker will be maintained in Paterson.

—Pennsylvania, Easton. Paterson, N. J., silk manufacturers desire to locate at this place. They want the town to put up a building for them, 120 by 45, two stories. They expect to employ 150 hands. They would furnish machinery. J. Kempkes is the member of the silk firm who has visited Easton. A committee was appointed to canvass for subscribers to the stock, which will be issued to the amount of $25,000 or $30,000.

—*Pennsylvania, Easton. The new silk mill of the Haycock Co. is being equipped with machinery, the building having recently been finished.

—*Pennsylvania, Shamokin. The new mill of the Shamokin Silk Mill Co. is now running. Their building cost about $40,000, and the machinery $45,000.

—*Pennsylvania, York. It is now known that a new silk mill will be established here and operated by Clowes, Sothern & Moss Co., of Paterson, N. J., of which Judge W. F. Bay Stewart, of York, is president. The mill will be located at Norway Park, and work on foundation has been started. Architect Harry E. Yessler will have charge of construction. The building will be 40 by 260; brick, three stories.

—Pennsylvania, York. In addition to the Clowes, Sothern & Moss Co.'s new silk mill to be built here, it is probable that another silk mill will be put up very soon at the West end of the town. Among the projectors are D. Ashley, of Paterson, N. J., C. C. Kauffman of Columbia, Pa., and J. W. Steacy, of York. The building talked of will be 50 by 200; three stories.

—*Virginia, Norfolk. The Norfolk Silk Co. informs us that work will be started on their new silk mill at Lambert's Point about the middle of February, and they expect to have the plant in operation by the 1st of June, employing 300 hands on plain silk cloth. The power will be either steam or electricity. 350 looms will be installed. The company has a capital of $400,000. President, Otto Andreae, Jr., New York; vice-president, J. P. Andre Mottu; treasurer, H. A. Van Liew; secretary, J. T. Williams; superintendent, B. Goldsmith; selling agents, William Schroeder & Co. A weaving school is now in course of erection. The vice-president informs us that equipment has practically been contracted for.

Enlargements and Improvements.

—*Connecticut, Middletown. Plans have now been prepared for the addition to the factory of the Portland Silk Co., which provides for a two-story brick building. Their present plant is now running night and day. This addition will provide for making fancy silks.

—New Jersey, Union Hill. The old brick factory formerly occupied by the McIntosh Quilt Co., was recently leased by Reiling, David & Schoen, silk manufacturers of West Hoboken, who will use the plant as an annex, employing 100 hands.

Mills Starting Up.

—New York, Haverstraw. The silk mill at this place formerly operated by Goldschmidt, Backrach & Co., will probably be operated by a new company, now being formed; start to be made February 1.

—Pennsylvania, Quakertown. The silk mill formerly operated by the Eagle Silk Co. will soon be started up by a new company known as the Quakertown Silk Co., a New Jersey corporation. Capital stock, $30,000. Incorporators are Ira Abbott, George W. Harrison and Charles S. Stackpole. The mill contains about 50 looms.

Miscellaneous.

New Mills.

—Massachusetts, Fitchburg. John M. Barr has just started a yarn dyeing and bleaching plant on Culley St. Mr. Barr

has been for ten years overseer of dyeing for the Parkhill Co., Fitchburg.

—Pennsylvania, Philadelphia. W. A., Edward, and Frank Flanagan have leased the Leech Bros.' mills on Walnut Lane, Manayunk, and will establish a bleaching and dyeing works.

—*Rhode Island, Providence. It is reported that a new bleaching and dyeing plant will be established near the American Electrical Works by Frederick C. Sayles of Pawtucket. An artesian well is now being sunk. It is expected that building will be erected in the spring.

—*Rhode Island, Woonsocket. The Hamlet Mills property has been transferred to the Pycott Mfg. Co., who will take possession March 1 and start manufacturing leatherette goods, using their patent compound known as Pyralin. New buildings are being put up for the finishing department. It is expected that about 50 hands will be employed. We mentioned this project last spring.

Enlargements and Improvements.

—Illinois, Peoria. The Peoria Cordage Co. will double its capacity, enabling it to turn out 10,000 tons of twine and rope during the coming year. The company is said to have made large profits during the past six months.

—*New Jersey, Paterson. The new building which the Barbour Flax Spinning Co. is building here, will be used in connection with their dyeing and drying processes.

—Rhode Island, Pawtucket. The Charlton Mfg. Co. has leased a small mill owned by the United States Cotton Co., and will operate same in connection with their present plant at Ingrahamville. This company has recently been incorporated under the laws of the state of New York, with a capital of $150,000, for the purpose of converting, dyeing and finishing velvets, velveteens, plushes and corduroys. The officers are J. J. Hart, president; F. C. Sayles, Jr., treasurer; and Thomas Clark, secretary.

—Rhode Island, Providence. J. D. Minto, who operates the dyeing plant near the Manton Avenue Bridge, Manton, has purchased 32,000 feet of land in North Providence, bordering on the Woonasquatucket River. A new building, 200 by 66 feet and 16 feet high, will be erected, and another building 125 by 35 feet, three stories high, will be put up. About 75 hands will be employed at the start.

Fires.

—Massachusetts, Boston. The plant of the Ross Twine Co. at Jamaica Plain, was damaged by fire to the extent of $6000, on the 17th inst.

—New York, Cohoes. Fire, caused by an explosion, occurred in the upper part of the old American Hosiery Mill January 7. Damage was about $10,000, insured. The mill has not been running for some time.

—New York, Valatie. The wadding mill of the Hall & Clark Mfg. Co. was damaged by fire January 20, with a loss of $6000 to $8000. The fire was confined to the drying room. Fully insured.

—Pennsylvania, Lansdale. The mill of the Wyoming Mfg. Co., makers of chenille, was destroyed by fire December 29. The loss is estimated at $10,000. It is said to be partly insured. This company was formerly located in Philadelphia. The mill employed about 100 hands.

—Pennsylvania, Philadelphia. A fire occurred at the dye works of Thomas Dawson & Co., Amber and Silver Sts., January 16. The fire started in some yarn, and loss to building and stock is estimated at $10,000; insured.

—Rhode Island, Bridgeton. The mills of the Laurel Hill Yarn Co. were totally destroyed by fire January 21. Loss is about $60,000. This was a four set mill. The mill has been idle lately, but was started up on the day of the fire. It is believed that the fire started in the picker room.

Facts and Gossip.

—Connecticut, Mystic. The Mystic Manufacturing Company finds it necessary to run its plant until nine o'clock every night, to keep up with orders.

—Connecticut, New Britain. The New Britain Knitting Co. has a large number of orders on hand, and it is necessary to run the mills twelve hours a day. Improvements have recently been made at the mill.

—Connecticut, Oneco. The Oneco Mfg. Co., making knit underwear, is running its plant night and day.

—*Connecticut, Stafford Springs. We now learn that it is the seven set plant known as the Mineral Springs Mill, which John R. Scott, of Uxbridge, has leased. The plant will be operated immediately. It has 37 looms.

—*Delaware, New Castle. The Knowles Woolen Mills, which were expected to start up January 2, have not done so, and it is now understood that they will not be started until orders are received.

—Georgia, Augusta. W. H. Bishop is now placing machinery is his new bobbin factory. It is a three story brick building, 45 by 100, and will employ about 40 hands.

—Illinois, Chicago. The Chicago Waterproof Cloth Co. has been incorporated with a capital stock of $50,000. The incorporators are George W. Winslow, S. Allen Wilson and Franklin M. McClure.

—Illinois, Chicago. The R. J. Ederer Co. has been chartered with a capital of $50,000 to manufacture nets and nettings in Chicago. The incorporators are Henrietta Ederer, Louis B. Ederer and Karl Stoever.

—Maine, Lisbon Falls. The Worumbo Mfg. Co. has begun work on a government contract for 80,000 yards of light blue woolen.

—Maine, Portland. The George P. Gale Mfg. Co. has been organized under the laws of Maine with $25,000 capital stock, of which $500 is paid in. The purpose is to operate woolen mills. The officers are: president, George P. Gale, Boston; treasurer, Albert N. White, Pawtucket, R. I.

—Maine, Lewiston. The Cowan Woolen Company has a large Government con-

tract for blankets, and the plant is running day and night.

—Maine, Sanford. The Sanford Mills are running their worsted department to its full capacity night and day. The plush mill is also busy.

—Massachusetts, Fall River. The capital stock of the Arkwright Mills was reduced from $500,000 to $450,000 at a recent meeting of the stockholders. $450,000 is the amount which has been paid in.

—*Massachusetts, Fall River. The stockholders of the Laurel Lake Mills have subscribed for $100,000 new capital, and the company will thus be reorganized in accordance with the plan presented last November.

—Massachusetts, Pittsfield. The two mills of William E. Tillotson are busy at present. The woolen weaving, carding and spinning departments are running four nights a week until 9 o'clock on orders, and the worsted carding, spinning and combing departments are running all night and day with two sets of help.

—*Massachusetts, New Bedford. The Cornell Stocking Co. now has its plant in operation on Pope St., at present employing 35 hands. Their product is cotton seamless hosiery. The present equipment will turn off 250 dozen per day when in full operation. They do their own dyeing.

—Massachusetts, North Adams. The Arnold Print Works have made arrangements to sell their product independently of the commission house, and have established an office on the corner of Broadway and Leonard St., New York, in charge of A. C. Houghton, president of the corporation.

—*Massachusetts, Plymouth. The creditors of the Plymouth Woolen Mills have decided to form a new corporation and continue business. The offer of Messrs. Sawyer & Douglas to make cash payments of 25 per cent. in one year, 25 per cent. in two years and give personal notes for the remaining 50 per cent. has been accepted. The stock of the new corporation will be held by Messrs. Sawyer & Douglas as trustees until the 50 per cent. paid on their personal notes has been secured from assets and product of the mills.

—Massachusetts, South Hadley Falls. The Glasgow Manufacturing Company's mill, which has about 13,000 spindles, and has been shut down for about two years, is now reported as leased to out of town parties. It is expected that this plant will be started up, employing about 400 hands, under the management of a North Adams man.

—Massachusetts, Spencer. No. 2 woolen mill on Valley St., owned by Hon. Erastus Jones and Isaac L. Prouty and operated by Beebe, Webber & Co. of Holyoke, has been sold to Charles N. Prouty. It is understood that Beebe, Webber & Co. will renew their lease February 1, as they are very busy at present.

—New Jersey, Paterson. Julius Brandes Silk Mfg. Co. has been granted a charter. Capital stock, $300,000. Julius Brandes owns 1300 preferred and 540 common shares, August J. Roller 200 of each, and William W. Uhlinger 10 common shares. Julius Brandes at present operates a silk mill in South Paterson.

—New Hampshire, Lebanon. The Riverside Woolen Company has obtained a contract from the Government, for 72,000 yards of flannel, which will keep the mills busy and on extra time.

—New York, Brooklyn. Henschel E. Levy has agreed to purchase the entire plant, stock, assets, property and interests of the Arnold Knitting Mills Co., now of Nos. 113, 115 and 117 Fifth Ave., Brooklyn, N. Y., and formerly of Nos. 433 and 435 Atlantic Ave., Brooklyn, N. Y., the directors of the Arnold Knitting Mills Co. having resolved to terminate its corporate business. Henschel E. Levy will assume the payment of all existing liabilities of said corporation. All future deliveries should be charged to Henschel E. Levy. Mr. Levy was formerly a member of the firm of Levy & Gentsch, who did business under the name of the Etta Knitting Mills.

—*New York, Cohoes. William Duncan, whose dye works were destroyed by fire December 27, informs us that he cannot state what will be done regarding rebuilding at present. He has rented the Clifton Mill dye house for his present needs.

—New York, Hudson. The business formerly conducted under the name of Murphy, Liscomb & Co. (oils) will be carried on by E. W. Murphy & Co. Mr. Liscomb died early last year.

—New York, Newburgh. The Harrison & Gore Co. is the name of a new corporation, of which the directors are James A. Harrison, E. E. Gore, James Harrison, Jr., and F. J. Harrison, all of Newburgh. We suppose this is practically the same concern that has been operating a silk mill here under the name of Harrison & Gore.

—New York, New York City. The Queen City Embroidery Works is the name of a new corporation. Capital, $5000. Directors are Benjamin Stearns of New Rochelle, N. Y., and Nathan Schwab, 100 East 60th St., New York City.

—New York, Yonkers. The plant of the Fernbrook Carpet Co. has been transferred, at private sale, to the Toronto Carpet Co. The carding and spinning machinery and 36 of the looms will be moved to Toronto, and 40 ingrain looms have been sold to Henry Holmes, a carpet manufacturer on Trenton Ave. and Auburn St., Philadelphia.

—North Carolina, Concord. It now appears that the report that the Coleman Mfg. Co. (to be operated by negroes) was started December 24, was true only to the extent that the steam plant was started up and tested. The cotton machinery has not yet been installed.

—Pennsylvania, Chester. It is rumored that the Mallison Mills at Tenth and Morton Ave., which have been idle for over two years, will be started up. It was understood that Samuel L. Kent, formerly of the Kent Mfg. Co. of Clifton Heights, wished to secure this plant, but this rumor has been denied by the Chester National Bank, which owns the plant. Several parties are said to be negotiating for the mill.

—Pennsylvania, Lebanon. Westerhoff Bros. & Napier desire to move their silk mill at Paterson, N. J., to some town near Ephrata, Pa., where they have re-

cently established a mill. It is very likely that Lebanon will secure the location of this plant. Jacob K. Funck, North Ninth St., of the Lebanon Board of Trade, is interested.

—Pennsylvania, Philadelphia. The partnership between Kahn & Starrells, proprietors of the Quaker City Knitting Mills, 26 North 4th St., has been dissolved. N. E. Kahn will continue the management of the Quaker City Mills and J. M. Kahn, his son, as superintendent. Maurice Starrells will establish a new plant on Second St., near Chestnut St.

—Pennsylvania, Philadelphia. The firm of Conyers, Button & Co. went out of business January 1. They operated the Germantown Hosiery Mill, East Walnut Lane, Germantown.

—Pennsylvania, Philadelphia. Notice has been published of the expiration of the firm of Thomas Dolan & Co., and the retirement of Thomas Dolan from the manufacturing field. The woolen yarn plant at 1631 North Second St., below Columbia Ave., will be carried on by Joseph P. Truitt and Charles H. Salmon of the old firm, who will do business as the Keystone Spinning Mills Co.

—Pennsylvania, Philadelphia. The former partnership between Clinton H. Stafford, Edgar S. Stafford and C. Gordan Stafford, under the firm name of James Stafford's Sons, was dissolved by the death of Clinton H. Stafford, but the business will be continued by the two remaining brothers under the old firm name. Their plant is the Star Woolen Mills, Kram's Ave., Manayunk.

—Pennsylvania, Philadelphia. William B. Toland withdrew January 1 from the firm of Charles J. Webb & Co., wool and shoddy dealers. The business will be conducted as heretofore by the remaining partners, Charles J. Webb, H. E. Lincoln and J. S. Stevenson.

PERSONAL RECORD.

Cotton.

—Robert Allman has been appointed assistant superintendent of the Kerr Thread Co., Fall River, Mass.

—Robert Almond, carder in the Kerr Thread Co.'s mill, Fall River, has resigned to accept the position of assistant superintendent in Newark, N. J.

—J. F. Bacon, formerly of the Pearl Cotton Mills, Durham, N. C., has accepted a position as boss carder at the Wiscaset Mills, Albermarle, N. C.

—John M. Barr, for the past ten years overseer of coloring for the Parkhill Co., Fitchburg, has resigned and started a yarn dyeing and bleaching plant on Culley St., Fitchburg.

—We are informed that A. H. Bosworth, of Millbury, Mass., is filling the position of superintendent at the Millbury Cotton Mills, and is now running out the stock for the trustees of John H. Mason & Co. In our January issue we reported that he was holding another position, but learn that his true position is that of superintendent.

—Robert Burgess, who has been with the Pierce Mill, New Bedford, Mass., since it started, six years ago, and for the past three years as superintendent, has succeeded N. B. Kerr as agent of the Grinnell Mill, New Bedford. Albert R. Pierce will succeed Mr. Burgess as superintendent of the Pierce Mill.

—E. D. Byrd has left the Columbia (S. C.) Duck Mills and taken charge of the spinning at the Fairfield Mills, Winnsboro, S. C.

—William H. Cadwell, son of Agent William D. Cadwell, has been appointed superintendent of the Jackson Mills, Nashua, N. H. W. T. Spear, for the past eight years superintendent, now resigns, and will assume the duties of overseer in the cloth room, which position he filled previously to being promoted superintendent. W. W. Spear, who has been overseer of the cloth room while his father, W. T. Spear, acted as superintendent, has returned to the position of second overseer of the cloth room.

—S. S. Campbell, overseer of card room at the Chewalla Mills, Eufaula, Ala., is now overseer of the carding and spinning rooms.

—J. P. Carpenter has resigned his position as section hand in the spinning room at the Henrietta Mill, Henrietta, N. C.

—William Chandler, overseer of carding in No. 2 Harmony Mill, Cohoes, N. Y., has resigned.

—A. B. Chase has accepted the superintendency of the Valley Falls Co.'s cotton mills, Woonsocket, R. I. George Smith, formerly superintendent, resigned the first of the year, being in his 83rd year.

—Emil Claws, loom fixer in No. 2 weave room of No. 2 mill of the Merrimack Mfg. Co., has been promoted to the position of second-hand.

—Arthur Crocroft, an employee in the weave room of the Hope Co.'s mill, Hope, R. I., has taken charge of the cloth room at Jackson.

—S. L. Cutting, on February 1, entered on his duties as superintendent of the Cawthon Cotton Mills of Selma, Ala. Mr. Cutting was recently superintendent of the Avondale Mills, Birmingham, Ala., and, previous to that time, of the Gaffney (S. C.) Cotton Mills.

—C. E. Ebert, engineer and machinist at the Southside Mfg. Co., Salem, N. C.,

has resigned. He has held the position for over a year, and previously had charge of the twister and spooler room. J. W. Tysinger, who has had charge of the engine and machine work at night, has taken Mr. Ebert's place.

—Mark Edge, secondhand in the weave room of the Hargraves Mills Nos. 2 and 3, Fall River, Mass., since their construction, has gone to the Granite Mill No. 3, Fall River, to take charge of the weaving department.

—J. R. Federline, formerly of Roanoke Rapids, N. C., has taken charge of the spinning at the Courtenay Mfg. Co.'s mill, Newry, S. C.

—W. E. Field is now in charge of the weave room of the J. Snow Hardware Co., Tuscaloosa, Ala.

—Z. M. Floyd, formerly overseer of weaving at the Palmetto Cotton Mills, Palmetto, Ga., is now with the Phoenix Mills, Nashville, Tenn., as loom fixer.

—A. C. Giles, of Hope Mills, N. C., has secured a position as boss weaver for Holt, Gant & Holt, Elon College, N. C.

—William Gillis, who has been overseer of spinning room of the Chewalla Cotton Mills, Eufaula, Ala., is now secondhand of spinning at the Eufaula Cotton Mills, Eufaula, Ala.

—L. A. Gilbert, a popular overseer at the Saratoga Victory Manufacturing Co., Victory Mills, N. Y., has resigned.

—Richard Haley, of Ware, has been appointed secondhand in the weave room at No. 1 mill of the W. Warren Cotton Mills, West Warren, Mass.

—James Hardy, of Clayville, N. Y., has been appointed overseer of carding at the Dayville Woolen Mill, Dayville, Conn., succeeding C. Weeks.

—J. B. Harkey, recently superintendent of the Alabama Cordage Mills, Montgomery, Ala., has been appointed overseer of the card room of the Cordele Mfg. Co., Cordele, Ga.

—W. F. Henderson, night spinner at the No. 2 Henrietta (N. C.) Mill, has accepted the position of overseer of spinning, spooling, warping and reeling at the Eureka Cotton Mills, Englewood, Tenn.

—J. B. Holland has succeeded W. A. Wofford as secondhand in cloth room at the Pacolet Cotton Mills, Pacolet, S. C.

—John A. Hilton, of Pawtucket, R. I., is now employed in the finishing department of the Slater Mills Corporation, Slatersville, R. I.

—George Horton, Charlton City, Mass., has gone to Washington, La., to take charge of a cotton mill there.

—William Howard is boss mule spinner in the Nourse Mill, Woonsocket, R. I.

—Henry Howe, of Somersworth, N. H., is in charge of cotton spinning in the textile plant of the Massachusetts Reformatory, Concord Junction, Mass.

—A. P. Hunt, for the past year overseer of the cloth room at the Greenwood Cotton Mill, Greenwood, S. C., has been appointed superintendent of the Clinton (S. C.) Cotton Mill.

—John K. Kane, for a number of years overseer of spinning in the Grosvenordale Cotton Mill, North Grosvenordale, Conn., is in a similar capacity with the Appleton Co., Lowell.

—J. C. Kellar, formerly with the Elizabeth City (N. C.) Cotton Mills, is now night superintendent at the Gaffney Mfg. Co.'s mill, Gaffney, S. C.

—Charles R. Kenyon has accepted a position as boss carder in the Canonchet Mills, Canonchet, R. I.

—N. B. Kerr, superintendent of the Grinnell Mills, of New Bedford, Mass., has been appointed agent of the Boott Mills, Victor I. Cumnock having resigned.

—Rufus C. Kies, of Columbus, Ga., is superintendent at Farnumsville, Mass.

—C. H. Land, at one time overseer in the Brookside Mills, Knoxville, Tenn., has succeeded J. S. Terry as boss spinner at the above mills.

—F. S. Linnell, for the past three years overseer of the carding room of the Harris Textile Co., Phenix, R. I., has resigned.

—H. B. McAbee has charge of carding and spinning at night at the Elizabeth City (N. C.) Cotton Mills. He was formerly with the Kesler Mfg. Co., Salisbury, N. C.

—Walter McCollum, of Concord, N. H., has been engaged as beamer by Supt. H. F. Moody of the Roanoke Mills Co., Roanoke Rapids, N. C.

—Hugh McGuire has accepted a position as boss dyer at the Warren Cotton Mills, West Warren, Mass.

—W. F. McLendon, who has been secondhand in the spinning department of the Eufaula Cotton Mills, Eufaula, Ala., has gone to Cateechee, S. C., where he has a position with the Norris Cotton Mills Co.

—James McNaughton, recently overseer of weaving in the Granite Mill No. 3, Fall River, Mass., has accepted a similar position in the Pierce Mill, New Bedford, Mass.

—R. H. Morrell, overseer of carding and spinning for the Thorndike Co., leaves that concern to start up the No. 2 mill at West Warren. He is to have full charge of the entire mill.

—Robert Morrey, formerly with the Kerr Thread Mill, Fall River, Mass., is now with the Boston Thread & Twine Co., Jamaica Plain, Mass.

—James Parker, of Utica, N. Y., has removed to West Warren, Mass., to enter on his duties as superintendent of the cotton mills there.

—William M. Perry, recently with the J. R. Montgomery Co. at Windsor Locks, Conn., is now at the Lyman Mills, Holyoke.

—G. D. Pippen, formerly overseer of carding at the Chewalla Cotton Mills, Eufaula, Ala., is now night spinner of the Norris Cotton Mills, Cateechee, S. C.

—Charles H. Porter, of the Whitman Mills, New Bedford, Mass., has been ap-

pointed superintendent of the Bristol Mills, New Bedford.

—Enoch Rhoden, who has been second-hand at the Selma (Ala.) Cotton Mills, has succeeded Mr. Goodwin, who has gone to Columbus, Ga., as overseer of the weave room of the Chewalla Mills, Eufaula, Ala.

—Mr. Rogers, of Worcester, has secured the position of carder for the Central Mills Co., Southbridge, Mass., A. Verrier, resigned.

—T. J. Rush, boss carder of Hutcheson Mfg. Co., Banning, Ga., has accepted a similar position with the Palmetto (Ga.) Cotton Mills.

—James Sanderson, overseer in the cloth room of the Bristol Cotton Mfg. Co., New Bedford, Mass., has resigned.

—F. D. S. Savage, for the past year assistant overseer of spinning in the Elizabeth City (N. C.), Cotton Mills, has accepted a similar position at night with the Cannon Mfg. Co.'s mills, Concord, N. C.

—John Scott, who has been superintendent of the Willimantic Linen Co. for the past 21 years, has tendered his resignation to take effect as soon as the American Thread Co.'s directors can appoint his successor. Mr. Scott resigns owing to poor health.

—J. Henry Sculy, loom fixer at Indian Orchard, Mass., has resigned and gone to Gilbertville.

—William Shaw, formerly second-hand in the carding room at the Kerr Thread Co.'s mill, Fall River, has been promoted to the position of overseer in the same room, succeeding Robert Almond.

—J. F. Shirley, for 13 years an employee in the Piedmont Cotton Mills, Piedmont, S. C., has given up his position and gone to farming.

—R. L. Short has accepted the superintendency of the Lauraglenn Mills, Shelby, N. C., succeeding W. W. Wilfong. Mr. Short was lately with the Henrietta Cotton Mills, Henrietta, N. C., in their spinning room, and previously was employed in the Lauraglenn Mills.

—George Smith resigned last month as superintendent of the Valley Falls Cotton Mill, Woonsocket, R. I., aged 83 years.

—S. G. Smith, assistant superintendent of the D. E. Converse Cotton Mill, Glendale, S. C., has resigned and gone into business on his own account.

—J. A. South, who has been boss spinner at the Fulton Bag & Cotton Mills, Atlanta, for nearly six years, at the Atlanta Cotton Mills in a similar position seven years, and recently with the Tennessee Mfg. Co., Nashville, has accepted a position as overseer of spinning at the Stonewall (Miss.) Cotton Mills.

—Donald Stewart, of Providence, R. I., has been appointed superintendent of the Kerr Bag Mfg. Co.'s mill, Concord, N. C., succeeding Thomas Kirkman.

—E. D. Stogner, formerly with the Proximity Mills, Greensboro, N. C., is now with the Laurens Cotton Mills, Laurens, S. C.

—Timothy Sullivan, an employee in No. 1 mill of the Borden Mfg. Co., Fall River, Mass., died January 15, of heart disease.

—Horace Tinckham, at the stockholders' meeting of the Robeson Cotton Mills, January 4, was elected treasurer, and will also act as superintendent.

—Thomas Whalen, of Blackstone, Mass. has secured the position of second-hand of spinning in the Nourse Mill, Woonsocket, R. I.

—J. R. Withers has been elected secretary and treasurer of the Alpha Mills, Charlotte, N. C.

—W. A. Wofford, for eight years second-hand in cloth room at the Pacolet (S. C.) Cotton Mills, has become overseer of cloth room with the Whitney Mfg. Co., Spartanburg, S. C.

Woolen.

—A. R. Allen, recently overseer of dyeing at the Nort Andover Mills, North Andover, Mass., has a similar position in Faulkner's Mills, Lowell, Mass.

—Arthur Arnold, formerly loom fixer at the Summit Woolen Co., is now with the Excelsior Woolen Co., Wales, Mass.

—Charles W. Auel, for eleven years superintendent of Messrs. E. Kenyon & Son's mill, Kenyon, R. I., has resigned and gone to Providence.

—John H. Austin has returned to his old position in the Rock Mfg. Co.'s mill, Rockville, Conn., as assistant designer.

—W. R. Booth has accepted the position of boss dyer for the new mill of E. S. Stevens, Quinebaug, Conn.

—George Bowey has succeeded Mr. Sweet as overseer of the blanket department of the Sandford Mills, Sandford, Me.

—E. W. Burdett, paymaster for the Bigelow Carpet Co., Clinton, Mass., has been appointed agent.

—Peter Costello, formerly of Mechanicsville, Conn., has accepted a position as overseer of finishing at the Slayden-Kirksey Woolen Mills, Waco, Texas.

—Joseph Devlin has secured the position of overseer of burling and sewing for the Fitchburg Worsted Co., Fitchburg, Mass.

—Charles P. Doane, formerly boss weaver in Webster, Mass., has accepted the superintendcy of the Thomas Kent Mfg. Co.'s mill, Clifton Heights, Pa.

—Charles Dobbrow, formerly superintendent of the Wood River Mills Co., Wood River Junction, R. I., has been appointed superintendent of the Hawthorne Mills, Glenville, Conn.

—Edward Eccleston is now dresser in the Wickford Worsted Mill, Wickford, R. I.

—John Fitzgerald, cloth inspector for the Summit Woolen Co., Staffordville, Conn., since they started, has resigned and removed to Willimantic.

—Edward Flanagan, lately at Lowell, Mass., is now with the Black River Woolen Co., Ludlow, Vt., as overseer of finishing.

—Samuel W. Foster, for a number of years overseer of jack spinning in the Lowell Carpet Mills, Lowell, Mass., has resigned.

—James Fox, of Rockville, Conn., has secured a position as loom fixer at the Gilbert Mfg. Co.'s mill, Ware, Mass.

—Vesper L. George, instructor in the Lowell Textile School, Lowell, is to take charge of the designing department at the Normal Art School in Boston.

—Alfred Goggins, of Sabattus, Me., has accepted a position in Pittsfield, Me., where his father, James Goggins, is already employed.

—A. A. Graham has resigned as superintendent of the Dingley Mfg. Co., Philadelphia, Pa., and Samuel Haigh, formerly with the Quaker City Dye Works, has succeeded him.

—James Graham, formerly designer at Schaghticoke, is now in a similar position with the Pontoosuc Woolen Mfg. Co., Pittsfield, Mass.

—William Hall, superintendent of the worsted department of the Lorraine Mill, Pawtucket, R. I., resigned January 21. John Hall, his son, formerly overseer of drawing at the mill, has taken his place.

—Lyman Hamm, formerly boss weaver and designer at the Bound Brook (N. J.) Woolen Mills, has accepted a position in the Dundee Woolen Mills, Passaic, N. J.

—Peter Hardy, for a number of years spinner in the Cowan Woolen Co.'s mill, Lewiston, Me., has accepted a position as night spinner at Bridgeton.

—John Hartley, recently overseer of coloring at the Sterling Mills, Lowell, will represent the firm of F. E. Atteaux Company on the road.

—A. S. Harvey, boss shearer in the Megunticook Woolen Mill, Camden, Me., has resigned to accept a similar position with the Somersville Mfg. Co., Somersville, Conn.

—George T. Jackson, recently fixing looms in Gilbertville, Mass., has returned to his old position as second-hand in weave room in the Southwark Mills, Philadelphia, Pa.

—Joseph Jassemin has resigned as assistant superintendent of the American Worsted Co., Woonsocket, R. I.

—Frank Keegan has accepted the position of cloth examiner for William H. Prendergast, Bridgeton, R. I.

—Charles A. Kennedy has been appointed boss dyer of the H. L. Bowden Felt Mill, Millbury, Mass. He was for many years dyer at the Portsmouth Mills and for two years has been boss dyer for the Mayo Woolen Co.

—F. Kress, recently second-hand in the finishing room of the Broad Brook, Conn., woolen mill, has gone to Rockville, Conn.

—John Lancaster has accepted the position of boss carder at the woolen mill of Charles Greenwood, Corinna, Me.

—L. H. Love, overseer of weaving department of the George H. Gilbert Mfg. Co., Ware, Mass., has secured the position of overseer of the white worsted weaving department for the Fulton Worsted Co., Fulton, N. Y.

—John McGill, formerly of Pittsfield, Mass., is with the Cowan Woolen Co.'s mill, Lewiston, Me., as boss finisher.

—John McIntosh has resigned as boss dyer of the Hawthorne Mills, Glenville, Conn., to accept charge of the dyehouse for James Ray & Son, West Troy, N. Y.

—John Moir is now in the employ of the Summit Woolen Mill, Staffordville, Conn., as loom fixer.

—George F. Morris has resigned as loom fixer in the Devonshire Mills, Goff's Falls, N. H.

—Daniel E. O'Neill, second-hand of the card room of the Electric Woolen Mill, Worcester, Mass., has resigned.

—Samuel W. Oldroyd, who has been in the wool scouring business at Paterson, N. J., has been engaged as boss wool sorter by the Warren Woolen Co., Stafford Springs, Conn.

—Patrick Pearsall, of Pascoag, has accepted the position of boss spinner at the Manton Mill, Manton, R. I.

—John Richardson has been engaged by the Turner Worsted Co., Cleveland, O., to take charge of their dyeing department.

—T. Richmond, boss carder at Staffordville, Conn., has resigned.

—T. J. Rigney has resigned as finisher at the Bound Brook Woolen Mills, Bound Brook, N. J.

—Arthur Robbins of Stoughton, Mass., is now employed at the Hind & Harrison Plush Mill, Clark's Mill, N. Y.

—John Scaife is now boss carder and spinner at the mill of the Holstein Woolen Co., Salem, Va.

—George F. Schoettle, finisher at the Capital City Woolen Mills, Des Moines, Iowa, has resigned.

—Jerry Sheehan is now loom fixer at the Marland Mills, Andover, Mass.

—Fred C. Silk, head colorist of the Lowell Mfg. Co., Lowell, Mass., has resigned to accept a similar position with the Whittall Mfg. Co. of Worcester. Mr. Silk was with the Lowell Co. for 17 years.

—Alexander Smith has resigned as boss weaver for the Penobscot Woolen Co., Dexter, Me.

—Andrew Smith, assistant superintendent and designer of E. Kenyon & Sons' mill, Kenyon, R. I., will be promoted to the position of superintendent as soon as the mill starts up.

—Ray Smith, of Athol, Mass., has secured the position of bookkeeper in the woolen mill of C. J. Amidon & Sons, Hinsdale, N. H.

—A. W. Steffan has been appointed agent of Edward T. Steel & Co.'s mill, Bristol, Pa.

—Cornelius Weeks has recently severed his connection with the Dayville Woolen Co., Killingly, Conn., and is now overseer of the No. 2 card room in the Middlesex Co.'s mill, Lowell, Mass.

—James Williams, of Worcester, Mass., has been appointed boss carder for the Senaca Woolen Co., Senaca Falls, N. Y.

—S. Wolfender, formerly boss dyer of the Way Mfg. Co., 2d and Norris Sts., Philadelphia, has now charge of the dyeing department at Samuel Rowland's, Schuylkill Haven, Pa., who is doing a large business in dyeing and bleaching.

—James Woodhouse, overseer of carding of North Andover, is now in the employ of the Kennebec Worsted Co., Fairfield, Me.

Knit.

—Fred Beavin, of Hudson, will be boss spinner at the Pleasant Vale Mill, Greenwich, N. Y., which Edwin Groat is starting up. George Lape, of Hudson, will be boss washer and Alexander Smythe, of Rensselaer, boss knitter.

—Robert L. Bowley, of Crawfordsville, Ind., is to be superintendent of the new knitting mill to be run by the Fay Stocking Co., Elyria, Ohio.

—John Donahue has resigned as superintendent of the Clover Knitting Mill, Waterford, N. Y., to accept a similar position at the Mohawk Mills, Cohoes.

—William K. Ferguson, a bookkeeper in the Norfolk Knitting Mills, Norfolk, Va., was killed recently by a street car, while on his way to work. He was 60 years old.

—William Goyette is now in the employ of the Queen City Knitting Mills, Elmira, N. Y., as boss knitter.

—Thomas Hardy, formerly at Roanoke Rapids, N. C., has secured a position with the Portsmouth Knitting Co. of Portsmouth, Va.

—George E. Hathway, of Bennington, Vt., is now with the Superior Knitting Mills, Hoosic Falls, N. Y., as boss finisher. Nelson Rogers was his predecessor.

—J. H. Musgrove has resigned as superintendent of the D. M. Collins & Co. knitting mills, Pittsfield, Mass. Mr. Musgrove has been superintendent of the mills since they were started in 1882.

—Herbert Payne, formerly in the employ of the Olympian Knitting Co., of Utica, N. Y., has taken charge of the full fashioned hosiery department of Owen Osborne, Philadelphia.

—Joseph Perrin is manager of the Lion Knitting Mill, Cohoes, N. Y.

—John P. Stack has resigned as boss finisher for Akin & Davitt, Cohoes, N. Y., and gone to Philadelphia, where he has a position as superintendent of a knitting mill.

Deaths.

—James Adams, a machinist in the Chase Mill, Killingly, Conn., was thrown from a wagon December 28, and died shortly afterwards.

—Herman Beckman, head of the Northern Ohio Blanket Mills, Cleveland, Ohio, died at his home in that city recently, aged 75 years. He was born in Hanover, Germany, and came to America in 1847, settling in Cleveland. In 1872 he founded the firm of Beckman & Co., for the manufacture of wool shoddies. About 10 years later he began the manufacture of blankets, being at the head of the Northern Ohio Blanket Mills until the time of his death. Mr. Beckman's reputation was of the highest character. He was very much interested in charitable work, and was a member of the executive committee of St. Alexis Hospital for a number of years.

—George A. Fuller died last month at his residence, No. 53 Stimson Ave., Providence, R. I., of pneumonia. He was born in Leicester, Mass., in 1827. Upon leaving the public schools of that city, he learned the trade of card setting. From 1857-90, he was engaged in the manufacture of card clothing under the name of the Stedman & Fuller Mfg. Co., which was first started in Lawrence and later removed to Providence, and five years afterward, in 1890, was sold to the American Card Clothing Co., of Worcester, Mass., Mr. Fuller remaining in the company as director and manager of the Providence branch. On the death of the late Joseph Murdock, of Leicester, he was elected president of the company. Mr. Fuller was also president of the Mechanical Fabric Co. and vice-president of the Narragansett Mutual Fire Insurance Co., both of Providence, and during his long residence in Lawrence he was elected to various city offices and took much interest in its affairs.

—John Harvey, at one time superintendent of the Berkshire Woolen Mills for six years and later superintendent for the Pontoosuc Mill in Pittsfield, died recently at Great Barrington, Mass., aged 59 years.

—William Leonard, formerly a resident of Lakeport and a well-known hosiery man, died recently at Concord asylum.

—Hezekiah A. Nichols died recently at his home, 3 Huntington Place, Norwich, Conn., at the age of 84 years. He was bookkeeper and paymaster for the Falls Co. for a long period, having resigned a few years ago owing to ill health.

—Edward A. Palmer of Montville, Conn., for 17 years a director of the Massasoit Mfg. Co., Fall River, died recently of pneumonia.

—William H. Post, head of the William H. Post Carpet Co., Hartford, Conn., died January 13, at his home, after a week's illness, aged 65 years.

—Robert Russell, boss folder in the Dempsey Dyeing & Bleaching Co., Pawtucket, R. I., died on January 15, of pneumonia.

—James Thorburn, salesman for Greeff & Co., of 112 Spring St., New York, died January 19. He had been connected with the above firm for six years, and was held in high esteem.

Recent Sales of Mill Shares.

	Lowest.	Highest.
Granite	93	100
King Philip	102½	102½
Shove	90	90
Merrimack	955	955
Stafford Spinning	105½	105½
Lyman	54¾	61½
Arlington	100½	101
Nashua	540	541
Bates	125	126
Atlantic	45	45
Franklin	100	100
Great Falls	140	140½
Hill	31½	37¾
Barnaby	70	70
Narragansett	95	95
Weetamoe	55	60
Salmon Falls	195	195
Naumkeag	55¼	55¼
Lawrence	115	115
Lowell Mfg.	520	520
Amory	126	126
Boott	740	740
Massachusetts	90½	91
Pacific	2020	2020
Massachusetts (Georgia)	112½	118
Hamilton Mfg	657½	657½
Middlesex	117	117
Aetna	65	65
Hamilton Woolen	40½	40½
Chace	102¼	102¼
Cornell	115	115
Globe	85	85
Hargraves	104	104
Richard Borden	107	107
Wampanoag	95	95

Patents.

(Continued from page 24.)

Loom Let-off Motion, Weaving. 617,045. J. Poyser, Wirksworth, Eng., and F. L. Ball, Birmingham, Eng.

Loom Pattern Arresting Mechanism. 617,290. G. F. Hutchins, assignor by mesne assignments to Crompton & Knowles Loom Works, Worcester, Mass.

Looms, Intermediate Selvage Forming Mechanism for. 617,859. W. J. Lutton, Paterson, N. J.

Loom Shuttle Guard. 617,590. M. T. Melvin, Fall River, Mass.

Mercerizing Apparatus. 616,606. H. David, Paris, France.

Mercerizing Machine. 616,709. J. R. Hope, Philadelphia, Pa., assignor of two-thirds to T. McConnell, Chester, and W. Galey, Overbrook, Pa.

Pile Fabrics, Machinery for Cutting Weft. 616,716. J. J. Mann, Paris, France.

Mercerizing Machine. 617,561. H. W. Butterworth, Philadelphia, Pa., assignor to H. W. Butterworth & Sons Company, same place.

Mule, Self-acting. 617,048. J. Ramsden, A. Taylor and E. Firth, Batley, Eng.

Roving Machine. 617,511. W. C. Peirce, Providence, R. I.

Silk, Manufacturing Artificial. 617,009. M. Fremery and J. Urban, Oberbruch, Ger.

Spindle Driving Bands, Mechanism for Guiding and Applying Tension to. 617,276. J. Boyd, Glasgow, Scotland.

Spinning Machine, Mule. 617,141. W. Bonney, Linwood, Mass.

Spinning Fibrous Materials, Self-acting Mule for. 618,259. W. T. Watts and W. Storrs, Stalybridge, Eng.

Spinning Machine. 618,229. J. Marjerison, Lawrence, Mass.

Spinning Machine. 618,233. H. A. Owen, assignor to Whitin Machine Works, Whitinsville, Mass.

Spinning or Twisting Frame End Cover. 618,358. G. W. Knight and H. W. Bracken, Hopedale, Mass., assignors to Draper Company, Portland, Me. and Hopedale, Mass.

Stockings, Gum Elastic Top for. 618,267. R. Gutsche, Philadelphia, Pa.

Spindle Step, Roller Bearing. 617,370. T. J. Tellefsen, Newark, N. J.

Spinning and Twisting Machinery. 617,677. A. D. Emery, Taunton, Mass.

Spinning Apparatus, Progressive. 617,680. A. D. Emery, Taunton, Mass.

Spinning Head. 617,678. A. D. Emery, Taunton, Mass., assignor to Universal Loom Co., New York.

Spinning Head. 617,681. A. D. Emery, Taunton, Mass., assignor to Universal Loom Co., New York.

Spinning Machinery. 617,679. A. D. Emery, Taunton, Mass., assignor to Universal Loom Co., New York.

Spinning Mechanism. 617,682. A. D. Emery, Taunton, Mass.

Warp Stop Motion Apparatus. 618,378. G. O. Draper, Hopedale, Mass., assignor to Draper Co., Portland, Me. and Hopedale, Mass.

Weaving Double Plush Fabrics. Double Acting Jacquard Machine for. 616,769. E. Claviez, Chemnitz, assignor to Kuntsweberei, Claviez & Co., Gesellschaft mit Beschrankter Haftung, Leipsic, Germany.

Wool, Hair, Etc., Machine for Shearing Cutting, or Clipping. 616,448. F. Burgon, Sheffield, England.

Woven Fabric. 616,774. J. C. Davis, Philadelphia, Pa

—Rhode Island, Wyoming. A writ of attachment has been served on the property of the Hope Valley Silk Mfg. Co. to secure a claim of Russell Murray & Co., 100 Grand St., New York, dealers in raw and thrown silk, for $1,600. The mill has been stopped. It will be remembered that this plant is a new one, which started up last fall.

—South Carolina, Jonesville. The Jonesville Knitting Mills Company has applied for a commission to increase its capital stock from $5,000 to $15,000.

—South Carolina, Rock Hill. Robert Lee Kerr, cashier of the Commercial & Farmers' Bank, has been appointed receiver of the Rock Hill Cotton Factory. This plant has been shut down for several months. It was reported last December that the property was to be transferred to new owners, and the appointment of a receiver may be the first step in this direction.

—Vermont, Bennington. Holden, Leonard & Co.'s woolen mill is running five nights a week until 9 o'clock.

VULCAN ROVING CAN.

Body—Vulcanized Fibre. SIDE SEAM—Riveted with Patent Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges, BOTTOM—IXXX. Tin Star Corrugation: Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one half pound per inch diameter. SIZE—All cans to an exact size, perfectly round and true. DURABILITY—Superior to any other can.

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ON Fitchburg R. R. in town of Troy, N. H. 150 H. P. (water power developed.) Saw Mill and Tenement House on property. Ample land, no taxes, will be sold cheap. Address GEO. DALRYMPLE, Fair Haven, Vt.

MACHINERY Shafting, Hangers, Pulleys and Couplings. Machinery Steel in all sizes from 6 1-2 inches diameter down to 3-16 inch diameter, cut any length, always in stock. Cold Rolled Rounds, Squares, Flats, Hexagons, Octagons, Decagons, and all shapes finished to exact sizes. Everything in readiness to be shipped at once. Our goods are without a rival and our prices the lowest of all.
Telephone 314, South Boston.
COMPRESSED STEEL SHAFTING WORKS,
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WANTED.

Union special twin needle flat bed, for sewing edging, also over seaming, Singer finishing, or U. S. finishing machines for ribbed underwear. Address, U 176, care of Textile World.

Foreman of Silk Weaving.

Age 30; unmarried. Graduate of the weaving school of Vienna, and employed for a number of years in the silk mills of Austria. Has been five years in this country and speaks English very well. Is familiar with weaving neckwear silk, dress goods and handkerchiefs, also suspender and elastic webbing. He is also a designer. Expects $3 per day to start. If interested, address, "R. S.," care of Textile World's Employment Bureau, 620 Atlantic Ave.

Notice to Silk Manufacturers.

The services of a young man with four years' experience in accounting for one of the largest silk manufacturers, and who is now holding a responsible position but without sufficient opportunity for advancement, can be obtained by addressing "Worker," care Textile World.

—Rhode Island, Woonsocket. At the creditors meeting of the American Worsted Company, January 31, a committee consisting of John W. Ellis, chairman, Judge Ambrose Freely and Edwin G. Baker, of Providence, was appointed to settle up the affairs of the company. A mortgage of $50,000 has been recorded given by the American Worsted Co. to

W. S. KELLEY,

Consulting Electrical Engineer.

Particular attention given to the distribution of power in mills by electric motors; also to development of water power, and electrical transmission. Plans and specifications prepared.

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30 Nightingale St., BOSTON.

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A man, familiar with cotton combs, to take charge or to act as second hand of combing and carding (English machines). Night work. Good pay and steady job. G. C. V., care Textile World.

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We have a few copies of the American Dyer, by Richard H. Gibson, published in 1878. As a text book for modern methods, it is, of course, entirely out of date, but as a hand book of the old school, covering the natural dyewoods, indigo, etc., it is probably the best ever written, and no doubt many a dyer would be glad to have a copy. The books have been consigned to us by his wife, who is in most reduced circumstances. The book originally sold for $10, but the few copies remaining will be sold for $5 each, the entire proceeds of which will go to Mrs. Gibson. Address

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Silk Salesman.

A man who has a good following in the dry goods trade would like to represent the account of a manufacturer of broad silks. Can give highest references. SILK SALESMAN. Care Textile World.

Wanted Boss Comber or Assistant.

One who has had experience with French and German Combs on cotton or short wool. Excellent chance for advancement. Address. C. S. M., care of Textile World.

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An advertiser would like to correspond with a superintendent who can either invest or influence some capital for a small mill in the South in contemplation. The man must thoroughly understand the manufacturer of brown sheetings. H. A. S. Care Textile World.

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run the lines of the Illinois Central Railroad and the Yazoo & Mississippi Valley Railroad, reaching into the eleven States of

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Presenting an unequaled territory for diversified industries, and possessing

Fine Sites for New Mills

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Intelligent Help of all Kinds

Many Kinds of Raw Material

To sound industries substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered **Textile Industries** in the South by a number of good places. GEORGE C. POWER, Industrial Commissioner I. C. R. R. Co., Chicago.

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but is also so much more that we will send you a sample can, and guarantee that the belts will stop slipping; the power will be permanently increased; the belts can be run slack; and the leather will become as soft as calf-skin, also absolutely water-proof.

We will further agree, that the increased power (in a fair sized plant) will earn the cost of the sample can EVERY MONTH.

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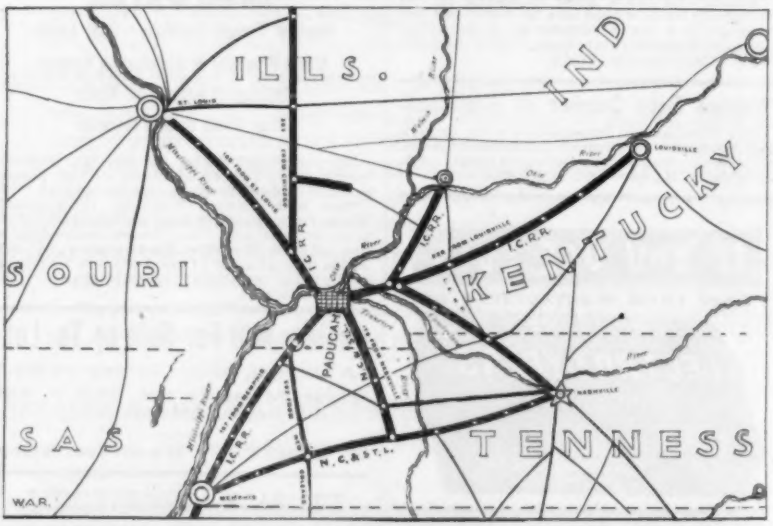

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BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.
Ferguson, John W, Paterson. N. J.

Automatic Feeds for Cotton and Wool.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Balling Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.
See under Yarns.

Belting.
Albany Belting & Supply Co., Albany, New York.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Billington, J. H. & Co., 113 Chestnut St., Philadelphia.
Boston Belting Co., 256 Devonshire St., Boston, Mass.
Fell, Geo. & Son, Bolton, England.
Link Belt Machinery Co., Chicago, Ill.
Popham, Henry, & Son, Newark, New Jersey.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Cling Surface Co., 168 Virginia St., Buffalo, N. Y.

Belt Hooks.
Field, Frank E., New Haven, Conn.

Bindings.
See Tapes and Braids.

Bleaching Materials.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Bobbins, Spools, Shuttles, Etc.
Nashua Spool and Bobbin Co., Nashua, N.H.

Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.

Braids.
See Tapes, Braids and Edgings.

Brass (Perforated.)
See under Perforated Metal.

Brushers.
See Napping Machines.

Burr Pickers.
Curtis & Marble Machine Co., Worcester Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Card Clothing.
Ashworth, Elijah, Fall Biver, Mass.
Leigh, Evan A, 35 Mason Building, Bostqn.

Calico Printers' Machinery and Supplies.
Butterworth, H. W., Sons & Co., Philadelphia.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
See also Dyeing, Bleaching Machinery, etc.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester, Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1788 Barker St., Phila., Pa.

Chemicals and Apparatus.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Chemist.
Adriance, John S., 105 East 39th St., New York.

Cloth Testing Machine.
McKnight, S, 771 Broadway, New York.

Combs (Wool and Cotton).
Crabb, William, & Co, Newark, N. J.

Copper (Perforated.)
See under Perforated Metal.

Copper Print Rollers.
New Bedford Copper Co, New Bedford Mass.
Phillips Co, The Thomas, Providence, R. I.
Revere Copper Co, 174 Oliver St, Boston.

Copper Work for Dyers.
Phillips Co, The Thomas, Providence, R. I.

Cotton (Egyptian).
Stoddard, Haserick, Richards & Co., Boston.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
Ashworth, Elijah, Fall River, Mass.
Cobb, Thad. S., Machinery Co., Lowell,
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Phillips Co, The Thomas, Providence, R. I.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R, I.

Cotton Openers and Lappers.
Howard & Bullough American Machine Co, Pawtucket, R. I.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y

Dextrine.
Stein, Hirsh & Co, 165 Duane St., New York.

Dryers.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dyers, Bleachers and Finishers.

Brophy's, T, Sons, Jasper St, Philadelphia.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Lee Woolen Co., Springfield, Mass.
Littlewood, G. J., & Sons, Manayunk, Pa.
Orianna Bleach Works, 2560 No. 3d St., Philadelphia.
Rowland, Samuel, Schuylkill Haven, Pa.
Warren, W, Thread Works, Westfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.

Birch Bros., Somerville, Mass.
Butterworth, H. W, & Sons Co, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, A, & Co, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Phenix Iron Foundry, Providence, R. I.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Dye Sticks.

Bailey, Frank, Cedar Brook, New Jersey.
Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

Dyestuffs and Chemicals.

Amend Process Co., 205-211 Third Ave., New York.
American Aniline Co., 138 No. Front St., Philadelphia.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Cochrane Chemical Co., 50 Kilby St., Boston.
Corey, S. J, 273 Congress St, Boston.
Dillon & Co, 20 Cedar St, New York.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Innis & Co, 3 Cedar St, New York.
Jaeck Bros., The, Co., 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Matheson, W. J, & Co, 182-184 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Pickhardt & Kuttroff, New York.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 133-137 Front St., N. Y.
Stone & Ware Co, The, 157 Maiden Lane N. Y.
Sykes & Street, 85 Water St, N. Y.
Thomas, N. Spencer, Elmira, New York.

Dyers and Finishers.

Boston Finishing Works, Williamstown Mass.
Cohoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol R. I.
Firth & Foster Co, Kensington, Pa.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Novelty Dye Works, Cincinnati, Ohio.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Warren, W, Thread Works, Westfield, Mass.

Edgings.

See Tapes, Braids and Edgings.

Electrotyping and Printing.

Whitcomb, H. C, & Co, Boston.

Elevators.

Cohoes Foundry & Machine Co, Cohoes, N.Y.
Eastern Machinery Co, The, New Haven, Conn.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Engineers, Mechanical.

Ferguson, John W, Paterson, N. J.

Express Money Orders and Travelers' Cheques.

American Express Co. offices in every city

Fans—Exhaust and Ventilating.

See Ventilating Apparatus.

Feeders

See Card Feeds.

Feed Water Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.

Filters for Water.

New York Filter Mfg. Co., 26 Cortlandt St., New York.

Finishing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Fire Extinguishers.

H. R. Bennett, 1217 Filbert St., Phila.

Fluted Rolls.

Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River. Mass.

Fulling Mills for Woolen Goods.

Hopkins, A, & Co, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Engines.

Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Singeing Machines.

Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.

Gear Cutting Machine.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E, Co, New London, Conn.

Harness Varnish.

D. L. Witmer & Bro, 5th St. and Germantown Ave, Philadelphia.

Heating.

See Ventilating.

Heddles.

Watson, L. S, Mfg. Co, Leicester, Mass.

Hosiery Boards.

Pearson, J. T, Kensington, Pa.

Hose and Rubber Goods.

Boston Belting Co., 256 Devonshire St., Boston.

Hydro Extractors.

American Tool & Machine Co., Boston.

Ink, Stamping.

Witmer, D. L, & Bro, 5th St. and Germantown Ave, Philadelphia.

Insurance (Employers' Liability).

Employers' Liability Assurance Co, 23 Central St, Boston, Mass.

Knit Goods Edgings, Trimmings, etc.

Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.
Weimar Bros, 1817 East York St, Phila. Pa.

Knit Goods Finishing Machines, Crochet, Etc.

Excelsior Sewing Machine Co, 120 N. 7th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila Pa.

Knitting Machine Cylinders.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.
Beattie, William, Cohoes, N. Y.
Branson Machine Co., 506 John St., Philadelphia.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Lamb Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Stafford & Holt, Little Falls, N. Y.
Standard Machine Co., 508 Minor St., Philadelphia, Pa.

Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co., Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Lydall, H, & Foulds, Manchester, Conn.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co, Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.
Bullock & Crenshaw, 528 Arch St Phila, Pa.

Lamps, Electric.
Edison, Thomas A., Jr., 27 William St., New York.
K. & W., The, Company, Pittsfield, Mass.

Looms.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila, Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Picker Manufacturers.
Crompton & Knowles Loom Works, Worcester, Mass.
Loom Picker Co, Biddeford, Me.

Lubricators.
Ameledema Oilless Bearing Co., Berkeley St, Wayne Junction, Philadelphia.
Dixon, Jos., Crucible Co, Jersey City, N. J.
Graphite Lubricating Co, Bound Brook, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.

Machinists' Tools.
Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Hermon St, Worcester Mass.

Mills For Sale.
Denny, R. B., 143 Federal St., Boston.

Mill Builders and Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Mitchell-Bissell Co., 170 Summer St., Boston.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Little Hustler Napping Co, Hudson, N. Y.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Novelties.
Stohn, C, 178 Green St, Jamaica Plain Mass.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Patterns of European Novelties.
European Pattern Supply Co., 530 Broadway, N. Y.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston, Mass.
Massink, H., Amsterdam, Holland.
Phillips & Anderson, 53 State St, Boston.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Penstocks.
Dalrymple, George, Fair Haven, Vt.

Perforated Metal.
Beckley, A. J. & Co., Garwood, N. J.
Harrington & King Perforating Co., 230 North Union St, Chicago, Ill.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
La Bar, L. T., Beateyestown, N. J.
Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills 2025 Naudain St., Philadelphia.

Pipe Covering (Magnesia).
Keasby, R. A, 83 Warren St, New York.

Pneumatic Conveying.
See Ventilating.

Porcelain Guides.
Mitchell-Bissell Co., 170 Summer St., Boston.

Power Transmitting Machinery.
Ameledema Oilless Bearing Co, 149 West Berkley St, Wayne Junction, Pa.
Channon, H, Co, 25 Market St, Chicago, Ill.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, C. W. Company, Staten Island, N. Y.

Hunter, Jas, Machine Co, No. Adams, Mass.
Jones, W. A, 53-59 South Jefferson Street, Chicago, Ill.
Kilburn, Lincoln & Co, Fall River, Mass.
Link Belt Machinery Co, Chicago, Ill.
Saginaw Manufacturing Co., Saginaw, Mich.
Wall, William F. Rope Company, 56 South St., New York.

Presses.

Boomer & Boschet Press Co., 338 West Water St., Syracuse, N. Y.
Crawford, J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, C. W. Co, Staten Island, N. Y.
Phillips Co, The Thomas, Providence, R. I
Pownall, F. H, Iron Works, Jamesburg, N. J.
Sullivan Machinery Co., Claremont, N H.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressing Irons, Gas and Air Heated.

Edwards Sad Iron Co , 1420 Chestnut St., Philadelphia.
Sheftall, C. H, Mgr, 305-307 Mercer St, New York.

Printers and Embossers.

Novelty Textile Printing Co, 447-449 W. 14th St, New York.

Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.

Reed and Harness Manufacturers.

American Supply Co, Providence, R. I.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.

Cheney Bros, S. Manchester, Ct.

Roller Skins.

Fell, Geo, & Son, Bolton, England.

Roofing, Gravel, Slag and Composition.

Armitage Mfg. Co, Richmond, Va.
Johns, H. W., Mfg. Co., 100 William St. New York.

Roofing, Paint and Paper.

Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.

Hill, Jas, Mfg. Co, Providence, R. I.
Laminar, Fiore Co., No. Cambridge, Mass.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.
Sullivan Machinery Co, Claremont, N. H.

Sample Cards.

Merchants Sample Card Co., 79 Crosby St., New York.
Yerrington, F. M, 17 Batterymarch Street, Boston.

Schools.

American Correspondence School of Textiles, Lowell, Mass.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Screens (Perforated.)

See under Perforated Metal.

Sewing Machines and Supplies.

Birch Bros., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Manufacturers' Supplies Co , 66 No. 4th St., Philadelphia.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Union Button Sewing Machine Co., 164 High St., Boston, Mass.

Shearing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.

Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.

See Wool Shoddies.

Shuttles.

See Bobbins, Spools, Shuttles, Etc.

Shuttle Eyes.

Mitchell-Bissell Co., 170 Summer Street, Boston.

Silk Machinery.

Butterworth, H. W. Sons Co, Philadelphia.
Crompton & Knowles Loom Works, Worcester, Mass

Singe Plates.

Butterworth, H. W. Sons Co., Philadelphia.
New Bedford Copper Co, New Bedford, Ms.
Revere Copper Co, 174 Oliver St., Boston.

Sizing, Starch and Gums.

Quaker City Chemical Co., Wayne Junction, Philadelphia.
Stein, Hirsch & Co, 165 Duane St, New York.

Slashers.

Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips Co, The Thomas, Providence, R. I.

Soaps.

Holbrook Manufacturing Co., New York.
India Alkali Works, Boston, Mass.

Spindles.

Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.

Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.

Hill, Jas. Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.

See Cotton Machinery.

Spinning Frames for Wool

Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.

Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.
Worcester Spinning Ring Co., Worcester, Mass.

Spinning Tubes.

Buckley, Benj'a. Son, Gun Mill, Paterson, N. J.

Steam Boilers.

Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.

Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Mutual Boiler Insurance Co, 31 Milk St, Boston.

Steam Engines.

Brown, C. H, & Co, Fitchburg, Mass.
Hooven (The), Owens & Reutschler Co, Hamilton, O.

Steam Specialties.

Butterworth, H. W. Sons Co., Philadelphia.

Tanks, Tubs and Vats.

Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, 195 High St, Boston, Mass.
Corcoran, A. J, 11 John St, New York.
Cypress Lumber Co, Apalachicola, Fla.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes, Braids and Edgings.

Fleming & Chapin, 229 Church St., Phila.
Friedberger & Co, Germantown, Pa.

Goff, D. & Sons, Powtucket, R. I.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Weimar Bros, 1817 East York St, Phila, Pa.
Young, Wm. M, 3638-40 Frankford Ave, Philadelphia, Pa.

Tentering Machines.

See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.

N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.

Howard, Geo. C., 1783 Barker St., Phila., Pa

Towers.

Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, Boston, Mass.

Traveler's Cheques.

American Express Company.

Turbines.

(See Water Wheels.)

Ventilating Apparatus.

Allington & Curtis Mfg. Co, Saginaw, Mich., and East Cambridge, Mass
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
New England Ventilating & Heating Co, Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philapelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Washers (Cloth).

Hopkins, A, & Co, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.

Watches and Clocks.

Elgin National Watch Co., Elgin, Ill.

Watchman's Clock.

Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nans & Co, 116A Chambers St, New York.

Water Wheels.

Bradway, C. P., W. Stafford, Ct.
Humphrey Machine Co., Keene, N. H.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.

Bradway, C. P., West Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.

Winders. (Hosiery.)

Universal Winding Co, 226 Devonshire St, Boston.

Wood Pulleys.

Saginaw Manufacturing Co, Saginaw, Mich.

Wool.

Lyon, John H, & Co, 12 Reade St, N. Y.
Pratt, Daniel S., 180 Summer St, Boston

Wool Cleaning Compound.

India Alkali Works, Boston.

Wool Combing Machinery.

Crabb, Wm, & Co, Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Townsend, Thomas, 157 Orange St, Providence, R. I.

Wool—Custom Work.

Lee Woolen Co, Springfield, Mass.

Wool Extracts.

Garfield Woolen Co, Garfield, N. J.

Wool and Waste Dusters.

Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen and Worsted Machinery.

Altemus, W. W, & Co, 2816 N. 4th St, Phila Pa.
American Tool and Machine Co., Boston.
Bates & Judson, Lowell, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Cobb, Thad. S., Machinery Co., Lowell, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 23d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
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Stoddard, Haserick, Richards & Co, Boston, Mass.
Woonsocket Machine & Press Co Woonsocket, R. I.
Woonsocket Napping Machine Co., Woonsocket, R. I.

Wool, Hair and Noils.

Becker, Chas. W, Agt, Amsterdam, N. Y.
Fowles & Co, 106 Church St, Phila.

Wool Shoddies.

Becker, Chas. W, Agt, Amsterdam, N. Y.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.

Wool Sorters, Scourers and Carbonizers.

Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.
Lee Woolen Co, Springfield, Mass.

Wool Washing, Preparing and Drying Machinery.

Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Moore, C. & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.

Burnet & Co., 24 George Sq., Glasgow, Scotland.
Catlin & Co, New York and Boston.
Clark, Wm, Co, Westerly, R. I.
Cohannet Mills, Taunton, Mass.
Crossland, Enos, Sons, Philadelphia, Pa.
Dana Warp Mill, Westbrook, Me.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fleming & Chapin, Philadelphia.
Germantown Spinning Co, Germantown, Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York City.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Orswell Mills, Fitchburg, Mass.
Sanford Spinning Co, Fall River, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.

Glazed Yarns.

Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
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Malcolm Mills Co, Frankford, Pa.
Meyer, John C. & Co., 87 Summer St., Boston.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Fawcett, Hughes, 115 Franklin St., N. Y.
Hadley Co, 95 Milk St, Boston, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Warren, W, Thread Works, Westfield, Mass
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

Boyer, B. F, & Co, Camden, N. J.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm. Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
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Colchester Mills, 86-88 Franklin St, New York.
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Hyde, E. S, 223 Chestnut St, Phila, Pa.
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King, Alex, & Co, 54 Leonard St, New York.
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Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Rockwell, E. M, Leominster, Mass.
Sanford Spinning Co, Fall River, Mass.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

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Holland & Webb, N. Y.

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Eichmann & Sternberg, 530 Broadway, cor Spring St., N. Y.
Goff, D. & Sons, Pawtucket, R. I.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

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Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, New York City.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Hawes, O. S, & Bro, Fall River, Mass.
Meyer, John C, & Co., 87 Summer St., Boston.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

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Crossland's Enos, Sons, Philadelphia.
Eddy & Street, Providence, R. I.
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King, Alexander & Co, 54 Leonard St, N. Y.
Rockwell, Edward M, Leominster, Mass.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Botany Worsted Mills, Passaic, N. J.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo. & Co, Phila, Pa
Campion, Richard, 17 Bank St., Philadelphia.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Elsasser, Albert R, Addingham, Pa.
Goff, D. & Sons, Pawtucket, R. I.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Phoenix Mills Co, 13 Letitia St, Phila, Pa.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Waverly Worsted Co, Main St. and Green Lane, Manayunk, Pa.

Alphabetical Index to Advertisements.

page

Adriance, John S. 155
Albany Belting & Supply Co. . . . 172
Alexander Bros., ... 178
Allegheny Worsted Mills. 142
Allington & Curtis . Outside Back Cover
Altemus, W. W. & Son, ... 11
Ameledema Oilless Bearing Co, . . 176
Amend Process Co 181
American Aniline Co., ... 152
American Correspondence School of Textiles 162
American Express Co., ... 14
American Napping Machine Co., . . 156
American Supply Co.. 8
American Tool and Machine Company 159
Anchor Color Mfg. Co, ... 150
Ardrey, S. B, & Sons, ... 169
Armitage Manufacturing Co, . . . 175
Ashworth, Elijah, ... 11
Bailey, Frank 18
Bamford & Smith, ... 156
Bates & Judson 158
Beattie, Wm. 168
Becker, Chas. W. . . . . —
Beckley, A J & Co. 152
Bennett, H. R. 178
Berry, A. Hun, ... 184
Billington, J. H. & Co. 173
Birch Bros. 18 153
Bischoff, C., & Co., ... 149
Blaisdell, P., & Co., ... 175
Boomer & Boschert Press Co. . . . 134
Bosson & Lane, ... 152
Boston Finishing Works, ... 145
Boyer, B. F, & Co, ... 141
Bradway, C. P. . . . . —
Branson Machine Co, ... 161
Breedon, Wm., & Son, ... 170
Bristol Co., The . Outside Back Cover.
Brophy's, T, Sons 152
Brown, C. H, & Co, ... 173
Brown, W. H, ... 12
Buckley's Benj., Son, ... 11
Burnet & Co. 141
Butterworth H. W. & Sons Co., . . 1
Caldwell, W. E. Co. 155
Campbell, Geo, & Co, ... 142
Campbell & Clute, ... 167
Campion, Richard, ... 140
Catlin & Co, ... 137
Challenge Wind Mill and Feed Mill Co., 154
Channon, H, Co. 15
Cheney Bros, ... 144
Clark, The William. Co,. 140
Clasgens, The J. & H. Co, ... 139
Cling Surface Co. 120
Cobb, Thad. S. Machinery Co. . . 13
Cochrane Chemical Co. 151
Cohannet Mills, ... 141
Cohoes Dye Works 145
Cohoes Foundry & Machine Co., . . —
Colchester Mills 139
Cooper, Chas, ... 169
Corcoran, A. J, ... 155
Corey, S. J., ... 152
Corey, Wm., Co., ... 170
Crabb, Wm, & Co, ... 12
Crane Mfg. Co., ... 164
Cranston Worsted Mills, ... 142
Crawford, J. J. & Son., ... 164
Croft, Howland, Sons & Co, . . . 142
Crosby & Gregory, ... 23
Crossland's, Enos Sons 140
Curtis & Marble Machine Co., . . 156
Cypress Lumber Co, ... 164
Dalrymple, Geo, ... —
Dana Warp Mill, ... 139
Denny, R. B. 128
Dillon & Co, ... 152
Dixon, Jos., Crucible Co., . . . 171
Draper Company 3
Dodge Needle Co. 164
Eastern Machinery Co. 173
Eco Magneto Clock Co, ... 12
Eddy & Street, ... 141
Edison, Thomas A., Jr. 16
Edwards Sad Iron Co., The . . . 128
Eichmann & Sternberg, ... 139

page.

Elgin National Watch Company . . 16
Elliot & Hall, ... 11
Elsasser, A. R. 139
Employers' Liability Assurance Corporation, Ltd., ... 18
European Pattern Supply Co. . . . 159
Excelsior Knitting Machine Co, . . 163
Excelsior Sewing Machine Co, . . 170
Fairmount Machine Co, ... 8
Farbenfabriken of Elberfeld Company, 148
Fawcett, Hughes, ... 137
Fell, Geo., & Son, ... 11
Ferguson, John W., . Outside Back cover
Field, Frank E. 18
Firth & Foster Co. 145
Fleming & Chapin 171
Fowles & Co., ... 158
Frame, Gibbons, ... 167
Friedberger & Co. 20
Furbush. M. A. & Son Machine Co, . . 24
Garfield Woolen Co., ... —
Geisenheimer & Co, Outside Back Cover.
Germantown Spinning Co., ... 136
Gerry, Geo. & Son, ... —
Goff, D. and Sons 140
Goulds Mfg. Co, ... —
Granger Foundry & Machine Co., Inside Front Cover.
Grant Yarn Co., ... 137
Graphite Lubricating Co, ... 175
Greene & Daniels Mfg. Co., . . . 140
Greenwood, R., & Bault, ... 145
Haedrich, E. M, ... 152
Hadley Co., ... 140
Harrington & King Perforating Co. Outside Back Cover.
Hart, Chas. 164
Hartford Steam Boiler Inspection & Insurance Co., ... 13
Harwood, Geo. S, & Son, Outside Back Cover.
Hawes, O. S., & Bro., ... 137
Hepner & Horwitz, ... 171
Hepworth, John W, & Co, ... 168
Herbst & Jones, ... 139
Holbrook Mfg. Co. 19
Home Bleach & Dye Works, . . . 145
Hopkins, A, & Co, ... 158
Hooven, Owens & Rentschler Co, . . 173
Howard, Geo. C., ... 11-12
Howard & Bullough Am. Machine Co., . 5
Hunt, C. W. 17
Hunter, Jas, Machine Co, ... 157
Hunt, Rodney, Machine Co, . . . 156
Hyde, Edward S., ... 136
India Alkali Works, ... 117
Indian Orchard Co. 138
Ives, Loyal T. 170
Jaeck, The, Bros Co., ... 152
Janney, O. S., & Co., ... 149
Jefferson, Edw, & Bro., ... 119
Jenckes, E., Mfg. Co., ... 137-166
Johns, H. W. Mfg. Co. 24
Johnson, Chas. A., & Co., ... 155
Johnson, Wm. G, & Co. 146
Jones, Lewis 170
Jones, W. A, Foundry and Machine Co, 13
K. & W. Company 175
Keller, John J., & Co. 147
Kennebec Woolen Mills, ... 139
Kennedy, Thos. 168
Kilburn, Lincoln & Co., ... 10
King, Alex'r & Co., ... 137
Klipstein, A, & Co., Outside Back Cover.—151
Koechl, Victor, & Co. 146
Krout & Fite Mfg. Co., ... 171
La Bar, L. T. 12
Lamb, Mfg Co. 163
Laminar Fibre Co, ... 12
Lee Woolen Co., ... 159
Leffel, James, & Co, ... 172
Leigh, Evan Arthur, ... 8
Leighton Machine Co., ... —
Lincoln. The. Co. 153
Link Belt Machinery Co., ... 13
Little Hustler Napper Co., . . . 169
Littlewood, G. J, & Sons 144
Lombard Water Wheel Governor Co., . —
Loom Picker Co. . . . . —

	page
Lowell Machine Shop,	2
Lowell Textile School,	162
Lydall, H., & Foulds,	170
Magnesia, Outside Back Cover	
Malcolm Mills Co.,	142
Manufacturers' Supplies Co.	170
Mason Machine Wks.,	7
Massink, H.	23
Matheson, & Co., Wm. J.,	148
Mayo Knitting Machine & Needle Co,	165
McKnight, S.	158
McMichael & Wildman Mfg. Co,	166
Merchants Sample Card Co.	19
Merrimac Chemical Co,	—
Merrow Machine Co.,	167
Meyer, John C. & Co.	148
Mitchell Bissell Co.	119
Mitchell Jas. E., & Co.,	137
Montgomery, J. R., Co.,	138
Monument Mills,	140
Moore, C., & Co.,	139
Mueller, A.	170
Mutual Boiler Insurance Co,	176
Nanz & Co,	18
Nashua Spool and Bobbin Co,	12
New Bedford Copper Co.,	153
New England Ventilating & Heating Co.,	154
N. Y. & Boston Dyewood Co,	146
New York Filter Mfg. Co, Outside Back Cover	
Novelty Dye Works,	144
Novelty Textile Printing Co,	152
Nye & Tredick,	160
Oakes Mfg. Co.	150
Orianna Bleach Works,	152
Orswell Mills,	138
Pawtucket Dyeing & Bleaching Co.	145
Paxton & O'Neill,	167
Pearson, J. T.,	171
Pepper Mfg. Co.,	154
Phenix Iron Foundry,	153
Philadelphia Drying Machinery Co.	10
Philadelphia Textile Machinery Co.,	9-154
Philadelphia Textile School,	162
Phillips & Anderson	23
Phillips, The Thomas, Co,	176
Pickhardt & Kuttroff,	22
Popham, Henry & Son	152
Pratt, Daniel S.	141
Quaker City Chemical Company	12
Quilter, James H.	162
Revere Copper Co,	153
Rockwell, E. M.,	139
Roessler & Hasslacher Chemical Co,	149
Rowland, Sam'l	170
Ryle, William, & Co.,	144
Saginaw Mfg. Co.	178
Sanford Spinning Co.,	134
Sargent's, C. G., Sons,	—
Scott & Williams	163
Sharpless Dyewood Extract Co.,	151
Skerry, A. T, & Co,	143
Solis, Andrew J. Jr., & Co.,	138
Stafford & Holt,	167
Stamford Mfg. Co.,	150
Standard Machine Co.,	168
Stearns, A. T, Lumber Co,	155
Stein, Hirsch & Co.,	12
Stillman-Randall Machine Co.,	158
Stockwell & Ensor,	169
Stoddard, Haserick, Richards & Co,	10
Stohn, C.	171
Stone & Ware Co,	151
Sturtevant, B. F. Co., Inside Back Cover	
Sullivan Machinery Co,	18
Sykes & Street,	150
Thomas, N. Spencer, Co,	151
Thurston, A. G. & Son,	11
Torrance Mfg. Co.,	158
Treat, Orion,	171
Tucker & Cook Mfg. Co.,	137
Union Button Sewing Machine Co.	160
Universal Winding Co.,	134
Wall, Wm. F., Rope Co.	18
Walcott & Campbell Spinning Co,	141
Walder, J.,	8
Ward & Vandergrift,	12
Wardwell Needle Co.,	170
Warren, W., Thread Works,	136
Watson, L. S, Mfg. Co,	11
Waverly Worsted Co,	141
Weimar Bros,	171
Whitcomb, H. C, & Co,	119
Whitin Machine Works,	4
Whitinsville Spinning Ring Co.,	8
Whiton D. E. Machine Co.,	175
Whittier Cotton Mills,	138
Witmer, D. L, & Bro,	170
Woolford, George,	155
Woonsocket Machine & Press Co,	6
Woonsocket Napping Machinery Co,	158
Worcester Spinning Ring Co.,	11
Wright, Brown & Quinby,	23
Yerrington, F. M,	136
Young, Wm. M,	170

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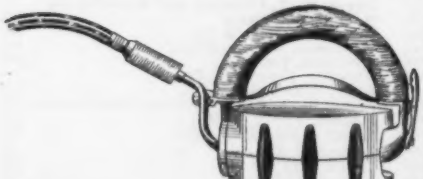

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1332 **Supt. with long experience** in both Northern and Southern mills. Has started 3 Southern mills, on print cloths, broad and narrow sheetings and fine shirtings. First class references from all past positions. Age 48. Might accept position as overseer of large weave room.

1108 **Cotton Superintendent** or would accept position as overseer of large mule spinning department. Has good references and a first-class record, and is a thorough mechanic; familiar with all kinds of yarns, especial hosiery and prints; age 40 and married.

578 **Cotton Superintendent** with experience as boss carder, master mechanic and superintendent on prints, sheetings, twills and sateens. An American of high character, and whose ability is proved by past record. Age 35, married; can accept position at once.

1390 **Cotton Superintendent.** Especially qualified for a mill making dress goods and fine shirtings. Experience with first-class mills as designer and manager. A young man of high character. At present employed.

1269 **Cotton** superintendent, carder, spinner and dresser; 48; married. Has held position in some of the best mills; is strictly temperate, and well recommended. Cotton, flannels, ginghams, crochet and Marseilles quilts, etc.

1236 **Supt. of Cotton Mill** desires to change position. Is thoroughly competent, steady and reliable. Good mechanic, manager, push and executive ability. Over 15 years experience, and fully understands how to keep production right as to quantity, quality, and lowest cost. Best system of economy maintained. First-class references can be given.

WOOLEN CARDERS.

1475 **Wool Carder and Spinner.** Out of work because his mill shut down. An excellent carder and spinner, highly recommended. Prefers the West. Will start at moderate salary.

1470 **Boss Woolen Carder.** Experience on great variety of goods: cassimere, beaver, asbestos, wool, cotton and shoddy mixes, also in knitting mill. Well recommended. Age 31, married.

1180 Wants position as 2nd hand of carding in woolen or knit mill. Age 23; single. Has been successful in like position. Prefers position in Mass., R. I., Conn., N. H., Penn., N. Y. or N. J. References if required.

1314 **Woolen Carder.** American. Age 30. Married. At present employed. Experience on beavers, cassimeres, cheviots, dress goods. Well spoken of by former employers. A first class man for a small mill.

1358 **Wool Carder,** now employed as second hand in large mill. Highly spoken of by past employers, habits, character and ability A1. Capable of taking charge of a room. Experience on high and low grade stock. Age 27, American, married.

1357 **Woolen Carder** now employed in satinet mill, has had 11 years' experience on fine goods and wishes to get back to that work; qualified to take a first class job. Age 39, English, married.

1248 **Carder,** woolen. Age 37 years; married. 10 years with one of the best mills in New England. Dress goods, beavers, blankets, cotton warp hair lines and kerseys.

1378 **Overseer Woolen Carding.** American, age 32, married. With one mill 13 years, and another 4 years. Excellent references from each. A first-class carder in every way.

COTTON CARDERS.

1432 **Overseer Cotton Carding.** This man has worked up from sweeping boy to overseer in the same mill and we have a letter from the former manager expressing the highest regard for his ability and character. Age 30, Married.

423 **Cotton Carder or Supt.** At present in the South but desires to return to the North. Early training and most of his experience was in N. E. mills. Understands combing. Age 38. Married.

1368 **Overseer on Second-Hand Cotton** Carding wants a position in small room at $2.50 per day or upwards. Will do his own grinding. Or, would take a first-class second hand job. Last five years in one place. Thoroughly practical and understands all the machinery in the card room. Age 37; married. Good reference. Prefers New England.

1238 **Second** hand of cotton carding. 37; married. Open for engagement.

1403 **Cotton Carder** with 17 years experience in N. E. mills as overseer and second hand, now in the South but wants to return North. Has never worked for less than $3.00 but would take $2.50 to change. Married. Age 38. Best of references.

1469 **Cotton Carder and Spinner.** Has had charge of both in good mills. Excellent references. Age 37, married.

WOOLEN SPINNERS.

1461 **Spinner, on Cotton or Wool.** Age 33; married; French. Has worked in one of the best thread works in this country, also in Alsace-Lorraine, on yarns from 70s to 160s. Is familiar with Dobson & Barlow machines and Schlumberger mules.

1299 Woolen Spinner who has had experience as second-hand would like a position as boss spinner. Would accept small salary to start. Has worked on sloakings, dress goods and Scotch tweeds in New England mill.

1276 **Spinner,** woolen. Wool and shoddy from 1-2 to 10 run, cassimeres, flannels, dress goods, underwear and blankets. Davis & Furber, Furbush & Sons, Johnson & Basset, and Schmidt machinery. Good references.

633 **Woolen Mule Spinner** desires to move from Maine on account of wife's health. At present in good position. Age 37; married, Scotchman.

COTTON SPINNERS.

1424 **Overseer, Spinning.** Mules preferred. At present employed. Has held position as overseer 6 years. Single. Will go anywhere.

1407 **Cotton Frame Spinner** now in charge of nearly 30,000 spindles in a Southern mill wants to return north. First-class reference both north and south where he has worked. Age 30. Married. American.

1438 **Cotton Mule Spinner** who has worked on plain white goods only desires to secure a permanent position in the Eastern or Central states. Has good references and is perfectly reliable. Age 45. Married.

1429 **Cotton Ring Spinner** who has been overseer 5 years and second hand 8 years. Worked on white and colored yarns, spooled and twisted. Refers to past employers in Maine and Mass. Age 36. Married.

1471 **Overseer Ring Spinning,** spooling, warping, twisting. 13 years' experience in England and 6 years in this country. White and colored yarns from 5s to 90s. Refers to past employers. Age 38, married.

1187 **Overseer of Dressing** or spinning wants a position in a cotton mill. Is an A1 man on colored or white goods, and understands slashing and beaming thoroughly. American; age 38; married. Has had charge in some of the best mills of New England. Sheetings, shirtings, dress goods, cheviots, flannels and sateens. Familiar with Mason, Whitin and Lowell machinery.

1280 **Wanted, situation** as overseer or second hand of mule spinning by a thorough, practical man. Good references from past and present employers. Understands all English makes of mules. Will go South or Canada

1158 **Overseer of Ring Spinning,** spooling, warping and slashing wants position on white work, fine or coarse. Age 46; single. Will go anywhere. Good references. Familiar with Mason, Bedford, Lowell and Fales & Jencks machinery.

WOOLEN WEAVERS.

1433 **Overseer Woolen Weaving.** More than 18 years' experience in large mills in Canada and the States. He is highly recommended for position of boss weaver or assistant superintendent. Experience covers a large variety of cloths on Crompton & Knowles looms. Age 36. Married.

1434 **Boss Weaver, Woolens.** Wants a job in a large mill and can handle same in good shape. Age 36. Married. Has made fancy worsteds, fancy cassimeres, meltons, dress goods, etc.

1340 **Worsted Weaver** would like position in a small mill at moderate salary; experience as fixer and in cloth room. Age 38, married. Knowles and Crompton looms; references good.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 36; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels. Will not go South, West or Pennsylvania.

1468 **First-Class Weaver** on fancy woolens, worsteds and meltons, cotton worsteds and shoddy goods. Can take overseer position after 6 days' notice. Has been loom fixer, boss and superintendent. Age 43. Crompton & Knowles looms.

COTTON WEAVERS.

1463 **Overseer** of Cotton or Woolen Weave Room, or overseer and designer in small weaving room. Age 40; married; English. Has worked on plain and fancy cottons, cotton flannels, suitings, twills, velveteens, corduroys, etc., and a great variety of woolen and worsted goods. Is familiar with all makes of English and American machinery, cotton looms, plain and fancy; Knowles & Crompton woolen looms. Is not at present employed and can take a position immediately. Good references.

1459 **Fancy Cotton Weaving,** Slashing, etc. Age 38; married. Has worked on all kinds of fancy goods and is thoroughly competent in all departments of manufacturing, with the exception of spinning. Understands velvet and corduroy weaving. Is not at present employed and can take a position immediately.

1425 **Overseer, Cotton Weaving** Age 38. Married. At present employed in large Mass. mill where he has been for 7 years as overseer. Worked on all kinds of goods and is well experienced. American. Refers to past and present employers.

1380 **Overseer Cotton Weaving.** Held overseer's position for 5 years in Mass. mill, but now out because of change in management. A man of well-known ability. Age 48; married. American. One of the best weavers in New England. Will go South to a good position.

1334 **Jacquard and Dobby Weaver** and designer on Knowles machines. 8 years' experience in this position. At present employed and can furnish excellent references. Age 38; married.

1333 **Overseer of Cotton Weaving** with more than 20 years' experience in weave rooms of N. E. and Canadian mills. Experience on all kinds of white and colored, plain and fancy work, except Jacquard. American and English, looms. Married; age 37.

DYERS.

1457 **Dyer.** Age 26; has worked on yarns, pieces, raw stock, indigo vats and cotton yarn. Is at present employed, but can take a position on short notice. Refers to past and present employers.

1467 **Cotton or Worsted Dyer.** Large experience as second hand and boss. At present employed but desires change for good reasons. Would start at $2 50 a day.

1460 **Boss Dyer.** Age 32; married; English. Will take a position in any of the Northern states, but prefers the vicinity of Philadelphia, if possible. Is at present employed, but can take a position after Jan. 1st. Has worked on cotton yarns, braids, cotton piece goods, hosiery, raw cotton and worsted yarns. Is familiar with Pierce & Bray cotton yarn dyeing machines, jigs and ordinary piece kettle machines.

180 **Woolen Dyer.** Age 42; married. Has had a large experience, and is a good practical man. Used to all classes of goods. Has worked largely on government orders. Good indigo dyer. Refers to former employers and others.

1355 **Wool and worsted Dyer,** a young man with 5 years' training by one the best dyers at one of the largest mills in N. E. Experience on worsted and woolen cheviots, clays, worsteds, suitings, cloakings, beavers, dress goods, carriage cloths, yarn, slubbing, wool. Now boss dyer. Good reasons for desiring a change.

1426 **Dyer,** silk or cotton. Age 45. Married. Italian. Learned trade in France. Has worked 23 years in this country in good mill. Refers to past employers.

1476 **Boss Dyer.** Experience on kerseys, broadcloths, dress goods, cassimeres and worsted piece dyes. Has been in good mills for 3, 5 and 7 years and gave satisfaction. Would start in New England or Central States for $3.00 a day.

1477 **Cotton Dyer and Finisher** of unusually wide experience in first-class New England mills. Highly recommended. A valuable man for above position. Age 35, married, American.

1278 **Wool Dyer.** Very successful and reliable and has had large experience. Practical indigo dyer. Can accept position at once. Best of references.

FINISHERS.

1428 **Overseer of Napping.** Young man just out of position because his mill stopped making fleece lined underwear. Experience on French machines and Davis & Furber cloth and knit nappers. Can refer to leading Mass. mill men for whom he has worked. Will go West. Single.

1214 **Woolen and Worsted Finisher.** A first class man. One that has had a thorough experience in one of the best mills in New England.

1437 **Finisher** wants to change present job for one paying $2.50 or more. Has had a wide experience for a young man. Has worked on many kinds of machines and has good references. Single. Age 30.

1351 **Woolen and Worsted Finisher** with 7 years' experience as overseer in R. I. and N. Y. mills, from which he has excellent references. At present second hand in one of the best worsted mills in N. E. Habits first-class; age 29, married

KNITTERS.

1455 **Superintendent, Boss Knitter** or Sewing Machine Fixer. Age 32; married. Not at present employed and could take a position at once. Has worked on balbriggans, together with all kinds of ribbed goods and flat work. Is familiar with the leading makes of knitting machines and all kinds of sewing machines. Good references.

1450 **Foreman or Superintendent of Hosiery.** Age 40; married. Has worked on cut feet, seamless half hose, ladies' and children's hosiery. Is familiar with every standard make of knitting and sewing machines. Is first-class finisher, and can start new plant. Salary moderate. Prefers to go South, if possible. Refers to former and present employers.

1441 **Supt. or Overseer in Hosiery** Mill. Age 49; married. Wishes to obtain a position near Boston. Cannot take a position before January 1st, 1899. Has worked on all classes of knit goods and is familiar with all the leading makes of machinery. Refers to past employers.

1402 **Circular Rib Knitter** now holding position as overseer in N. Y. mill would like to secure better position. Has worked on spring needle and welt work silks, worsteds, cotton, tuck stitch ladies' forms. Can refer to present and past employers. Age 24. American.

1224 **Boss Knitter.** At present employed, but wants to change. 15 years' experience on ribbed underwear; all kinds of ribbed machines and sewing machines. Strictly temperate. Good references.

1472 **Knitting Mill Superintendent** who has had 11 years' experience as superintendent and machinist. Has practical knowledge of the manufacture of all kinds of knit goods. References from past employers. Age 46, married.

DESIGNERS.

1444 **Designer.** Has made a special study of designing during the past ten years. Wants a position which offers chance for advancement. Has worked on all classes of goods and is familiar with standard makes of machinery. Can fix, set up and has started sections of new fancy looms.

1445 **Designer or Finisher**, or will take position as supt. of a small mill. German, protestant, age 36, married. Has worked in several New England mills and refers to them. Graduate of the Werden Textile school, Saxony. Has worked on kerseys, beavers, cassimeres, cheviots, etc. Is familiar with all makes of American and German machinery.

1431 **Woolen Designer or Superintendent.** Young man, at present employed, desires to secure a position as above. Has been assistant superintendent of 18 set mill making fancy cassimeres and worsteds. Single. References show him to be a man of good ability.

1449 **Overseer of Weaving or Designer.** Age 38; married; American. Thoroughly capable. Has designed his own goods for eight years, and studied designing for two years. Left last position on account of sickness, and will take a small salary to start. Has worked on all classes of cottons, plain and fancy, and is acquainted with all makes of machinery. Refers to former employers and others.

MISCELLANEOUS.

1474 **Designer** on novelty dress goods, cassimeres, blanket cloths, coverts. Philadelphia Textile School graduate and 3 years in first-class Massachusetts mill. At present out of work by shut down of mill.

1478 **Overseer Beaming, Slashing,** warping, quilling, wants position in mill making fine goods. Large experience on ginghams, shirtings, linings and fancy novelties. Well recommended by well known mills. Age 39, married.

1462 **Colorist, Chemist,** or Assistant in Print Works. Age 25; single; American. Acquainted with the printing of silkolines, sateens, cretonnes, dress goods, etc., and has a good knowledge of special processes. Is familiar with all machines used in bleaching, dyeing, printing and finishing. Is a graduate of the M. I. T. in Chemical Engineering.

1456 **Engineer.** Age 32; married; American. Wishes to obtain work in New England. Is not at present employed and can take a position at once. Is familiar with Corliss and high speed engines; can do his own indicating and adjusting and is a practical electrician.

1473 **Overseer Steam Gigging and** Boiling. Has worked for many years in large mills. Would accept $2.50 a day at start. Age 33, married.

1466 **Overseer of Dressing.** Experience on worsted cassimeres, dress goods, flannels. Good references, temperate, age 32, married.

1451 **Mechanic or Chief Engineer.** Age 37; married; American. A first-class mechanic and engineer. At present employed, but wishes to obtain a position where there is a better chance for advancement. Has been 2½ years in present position as master mechanic, and was previously for 13 years with one firm as department foreman, engineer and master mechanic. Refers to former and present employers.

1448 **Cashier or Bookkeeper.** Age 26; American, single. Is a college graduate and has been bookkeeper and paymaster for one firm for eight years, to whom he refers. He is competent to take any position of trust in a mill office.

1446 **Boss Machinist or Engineer.** American, 35 years old, married. 12 years in last place. Refers to former and present employers. Familiar with all repair work in cotton mill.

1335 **Loom Fixer or Second Hand.** Knowles and Crompton looms, fancy worsteds and cassimeres, dress goods. German; Protestant; age 37, married. Has been employed in good mills and is very well recommended.

1436 **Boss Dresser.** At present out of work because mill is running slack. Experience covers a large line of goods on D. & F. and Cleveland machines. Would start at $1.25 a day if work was steady. Age 26. Single. A very reliable young man.

1301 **Book-keeper and Paymaster.** Young man of the very highest character desires to move away from the Atlantic coast, on account of his health. Best references from his present and former employers.

1418 **Cloth Hall.** Overseer, shipping clerk or paymaster. Has had a thorough experience in each of the above positions and is familiar with white and colored cotton goods. Is well recommended. Aged 35. Married, and is also a good all around accountant.

TEXTILE BOOKS.

The following are recent publications, which we will furnish upon receipt of their price.

Plain Series of Cotton Spinning Calculations, by William H. Cook, 91 pages.

This book gives original calculations relating to cotton spinning, giving the position of the different pulleys and wheels, which are taken into consideration when making calculations; and also points where the necessary changes are made when altering from one count to another. Price $1.

Sizing Ingredients, Size Mixing and Sizing. By Hugh Morrie, Jr., 63 pages, Illustrated.

This book is intended to be a complete practical work dealing with everything relating to the modern processes of sizing, and takes up such subjects as sizing ingredients (flours, softeners, deliquescent substances); Size preparations (Chloride of Zinc, Whitening material, Percentage of size, etc.); Fermentation; Mixing; Construction of Sizing Machine; Working of the Machine; Definition of Technical Terms; Calculation, etc. Price $1.00.

Ornamental Design for Woven Fabrics, by Stephenson & Suddards. 273 pages, 66 illustrations.

This is a text book dealing with ornamental design for woven fabrics, for the use of the student, and has been written for the purpose of suggesting helpful ideas to designers and manufacturers of textiles, and aims at bringing artistic textile work into practical touch and closer relationship with the technical requirements of manufacturing. It takes up such subjects as Geometric Design; How to Plan an All-over Repeating Design; The Drop Pattern; The Sateen Arrangements; Borders, Corners, Stripes; The Structure of Ornamental Flowers, Foliage, etc. Price $2.50.

The Power Loom, by Alexander Brown.

This is a practical, well written treatise of 118 pages, on the construction of the power loom and the art of weaving, giving descriptions of the texture produced by different numbers of harnesses. The text is illustrated with diagrams, and contains calculations and instructions for the production of cotton, woolen, linen and jute fabrics. It was written with the intention of serving as a text book for those engaged in the trade. Notwithstanding it relates to English machinery, it is of value to those operating that of American make. Price $1.25.

Jacquard Weaving and Designing, by T. F. Bell. 300 pages. Fully illustrated.

The contents of this work have been derived from a long course of art and technical training, together with a lengthy practical experience in textile manufacturing and designing, by the author. The descriptions are as concise as is compatible with fairly clear explanation. Price $3.00.

Cotton Weaving and Designing, by John R. Taylor, 288 pages, fully illustrated.

This work is by a well known writer and lecturer on this subject, and treats of such topics as: Hand and Power Looms; Drop and Circular Box Looms; Dobbies; Jacquard and Leno Weaving; Terry Looms; Principles of Designing, Plain and Figured; and Textile Calculations. This work is of much value. Price $2.50.

Woolen Spinning, by Charles Vickerman.

This is a most excellent work for students in textile schools, and for skillful, practical men in woolen mills. It takes up the principles that underlie the various processes and operations of the earlier parts of manufacture. It has chapters devoted to Wool; Wool Sorting; Scouring; Bleaching; Mixing, etc., Carding and Spinning. 332 pages. Price $1.75.

The Student's Cotton Spinning, by Joseph Nasmith.

This is a standard book on spinning. It treats of mixing, opening, scutching, carding, card clothing, combing, roving, spinning, reeling, waste spinning, etc. 593 pages. Price $3.00.

The Mechanism of Weaving, by T. W. Fox.

A treatise of 464 pages, presenting exact and practical information upon the principles of weaving. Takes up such topics as Harnesses; Shedding; Dobbies; Jacquards; Card Cutting; Picking; Pickers; Swivel Weaving; Beating Up; The Reed; Taking-up Motion; Temples; Trimming and Fixing of Parts. 256 illustrations. Price $2.50.

Manual of Dyeing, by Knecht, Rawson and Loewenthal. In three volumes.

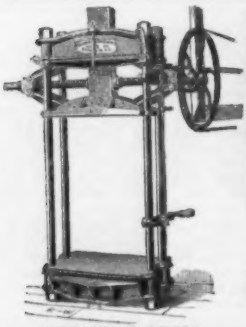
Decidedly the best work of the kind for a proper understanding of the present state of the art of dyeing, for the use of practical dyers, manufacturers and students. It takes up such subjects as, Water; Acids; Alkalies; Mordants; Natural and Artificial Coloring Matter; Machinery used for dyeing, etc. Has numerous illustrations and specimens of dyed fabrics. Price $15.00.

Draw Frames and Fly Frames. By Thomas Thornley, 380 pages.

This is the only work especially devoted to the drawing and roving processes, and is intended to benefit those who are directly concerned in the practical operation of the machines under discussion, with particular stress on the points which will give the best results from machines in their actual manipulation. Among the subjects treated may be mentioned the following: Drawing Frames; Fly Frames—Winding, Building Motion, Differential Motions; Roller Setting and Drawing; Defective Roving Bobbins; How to Put up Frames; etc. Price $2.25.

Cotton. By Christopher P. Brooks, 384 pages, 174 illustrations.

This is the most acceptable book on this subject that has been published. The subject has been presented in a remarkably attractive style, and is treated in a manner not to be found elsewhere. Cotton is considered in its botanical features, its cultivation, preparation for the market, and as an article of commerce. A full chapter is given on the commercial uses of the seed for oil, etc. It is a volume that will be of interest to the cotton factor, merchant, broker, and all whose business it is to buy or sell the fibre in its raw or manufactured condition. We cannot speak in too flattering praise regarding the merits of this book. Price $3.00.



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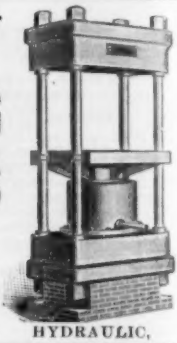

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SANFORD SPINNING CO.

Fall River, Mass.

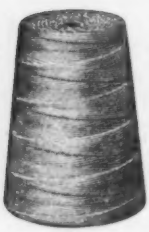
32,000 Spindles. Weekly product, 65,000 pounds 6s to 30s.

Colored Cotton Yarn

From American Peelers and Egyptian Cottons.

Solids, Mixtures, Bleached, Combed and Carded Egyptians. Cops and Cones.

The Best is the Cheapest.



It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

UNIVERSAL WINDING CO.,

F. H. BISHOP, Manager.

226 Devonshire St., - Boston, Mass.

YARN DEPARTMENT.

Eastern Yarn Market.

Worsted Yarn: Spinners are getting but few orders for yarn. The outlook is good, but weavers are not now in a position to know just what their requirements are to be, and hence are not ordering; besides, many believe that the time for speculating has gone by and that the best for a manufacturer is to buy on the market. The present condition of the domestic wool market does not warrant haste on the part of weavers. There is no doubt that many manufacturers who have been out of the market for 12 or 16 months are about to be forced again on the market to purchase tops and yarn. Orders are being placed on the quiet for serges and cheviots. These orders are being secured by mills who are buying their way into this market, and this class is being sold in some instances at cost in order to get started. This will not be the case later in the season for, as goods are sold and machinery employed, weavers will work prices up to a paying basis. The bulk of the manufacturers are opening up samples later this year than ever. For instance, overcoatings were opened January 1st, when the regular opening time is in December. The heavy weight worsteds, both piece dyed and fancies, will be opened before February 15th. Prices are low, but manufacturers are turning out cloth for less cost than ever before. Weavers are today running fast looms which turn out from one quarter to a half more cloth than was the case 5 or 6 years ago. It is the same with combing and spinning. Not long ago combs turned out 50 per cent. tops to 50 per cent. noils. Now 70 per cent. tops and 30 per cent. noils; and so it is also with spinning. It is said that at the present time worsted yarn, Australian quality, is selling within two cents per pound of what Australian wool would cost duty paid under the new law. It shows how badly this grade of yarn is selling. The only parties using this class of wool are the underwear trade. The weavers are using only ¼ to ⅜ blooded wool. The only weavers using fine Australian yarn are one or two Rockville mills. Serges are the rage at present, but we venture to predict that these styles will not run much longer. It is undoubtedly a fact that America follows the lead of England in men's wear. In England, 2/32s and finer for serges are entirely neglected, and we find that the trade is turning toward cashmeres and fine Botany worsted effects. Sooner or later manufacturers will feel the demand here, and a much higher cost will be the result to both the manufacturer for his material and the consumer for his cloths. The result of fashion turning largely toward Australian mixtures, together with the short supply of Australian wool, will keep prices up on fine wools. The knitters are contracting largely for French-spun yarn, and prices are well maintained. The knitters of underwear have not secured orders to any extent, but are placing orders for yarn, anticipating future requirements. Spinners of French yarn have orders to last two or three months. Manufacturers of hosiery anticipate a good business, but are looking largely for orders on ⅜ to ½ blooded yarn, because this yarn makes a very serviceable stocking at a popular price. Stocks of all classes of manufacturers are very low. Hosiery manufacturers tell us that their stocks are lower this year than has been the case for five years. The Astrachan trade is not prosperous, and style seems to be turning against these fancy effects of mohair. Spinners are taking more orders, but

(Continued on page 137.)

Frank E. Patterson, Prest. Oscar W. Wood, Treas

GERMANTOWN SPINNING COMPANY INCORPORATED GERMANTOWN JAN. 9TH 1890

Germantown Spinning Co.

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HOSIERY YARNS

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HOSIERY AND SEAMING YARNS.

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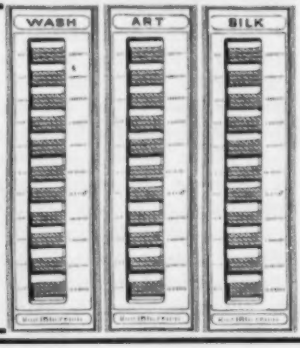

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Silk, Cotton, Linen Threads;

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MADE IN UNIQUE DESIGNS IN QUANTITIES.

F. M. YERRINTON,

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Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, **Philadelphia, Pa.**

Continued from page 135.

in small blocks. Prices are comparatively firm. Weavers are trying for lower prices than those quoted by spinners, but the latter say that they have struck bottom. It is evident that commission merchants are trying to see how low prices can be worked before placing orders in quantities.

Woolen Yarn: Spinners are getting some inquiries, but few orders. The outlook is satisfactory, and as soon as manufacturers begin to capture orders the spinner will surely have all he can attend to. That is, those spinners now in existence. The hosiery manufacturers are beginning to show samples, and the chances for getting orders are good. Already buyers are talking of placing much larger orders this year than last. The stocks carried over from the cheap wool period have been depleted, and jobbers are face to face with the fact that they must depend on domestic goods. The orders should be secured before March, and a good business ought surely result. The worsted weavers are placing orders for yarn, and it is a healthy sign of the times that this is the case, because many of them have been out of the market for fully two years. The mills throughout the Mohawk valley are not busy at this time, because it is between seasons. A much more cheerful tone is noticeable, and the mills will be forced to buy wool as soon as their requirements are known. We note that some mills are lowering the grade of their goods, while others are using the same material as under free wool. Some of the Boston wool men have been selling Australian lambs' wool very cheap for cash. We note that one concern purchased 40,000 pounds at 54 cents cash. This wool was offered one year ago at 62 cents, and could not be imported and duty paid for less than 72 cents. Some dealers are taking advantage of these prices and are buying lambs' wool on speculation. It may be that lambs' wool will not be as extensively used as

(Continued on page 139.)

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
206 Chestnut St., Philadelphia.

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY.
54 Leonard St., New York.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
6 & 8 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY **YARNS,**
All Plies and Numbers.
Imported Yarns a Specialty.
82 and 84 BEDFORD ST., FALL RIVER, MASS.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 40s and above. AND
FITCHBURG, MASS. **WARPS**

E. JENCKES MFG. CO.
Colored Cotton, Hosiery, Woolen and Merino **YARNS**
PAWTUCKET, R. I.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

MERCERIZED EGYPTIAN COTTON SPINNING BANDS.

We claim for them

- They will not shrink nor stretch.
- Are not affected by dry or humid atmosphere.
- Are Fifty per cent. stronger than ordinary bands.
- Will last twice as long.
- Less power required to run spinning.

Mercerized Cotton Yarns which give the High Silk-Like Luster.

Cotton Warps.

WHITTIER COTTON MILLS,
LOWELL, MASS.

YARNS

SOLIS : : BOSTON.

179 Devonshire Street.

ANDREW J. SOLIS, Jr. & CO.

INDIAN ORCHARD COMPANY,

Indian Orchard, Mass.

Manufacturers of - - - -

COTTON WARPS AND YARNS

In gray and all colors, single or in any twist.

COLORED COTTON

Machined, Carded or in Roving.

NOVELTY YARNS

In Cotton, Mercerized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.
We are always pleased to assist our patrons of the Woolen Goods manufacture in special pattern warps for samples.
We use a uniform grade of long stapled cotton in all our manufacture.

(Continued from page 137.)

heretofore because French thread waste will take its place to a degree, and French Australian threads can be sold, under the present duty, for 52 to 54 cents, against 68 to 72 cents. We note that natural black combed wool tops are in great demand, more being used this year than ever before. The worsted weavers in the Rhode Island district are using more woolen yarn this season than ever before, and if the demand holds out the weavers will have to scramble to have requirements filled. The closing of two or three spinning mills will be sadly felt when trade starts, as it surely will this season. When business is fairly good we have not spinning enough to take care of the trade, and with three or four spinners out of the trade a revival of the woolen industry will see a great shortage of yarn. The 2-ply yarn trade has some inquiries, but not many orders. From all directions the manufacturers say: "We are not ready to place orders, but we expect to be ready to talk business, and order yarn by or before March." There is certainly a very hopeful feeling, and manufacturers believe they are to have a revival of business.

Cotton Yarn: Spinners are running mostly on 1/20s and 1/24s white cop yarn. Some spinners are delivering sample cases of 1/11s, but no orders of any amount are being sold or delivered. The heavy weight season is backward, and most of the knitters have been in no hurry to place orders. Some of the knitters placed orders based on sample cases early in the season, which they will cancel in event of yarn selling cheaper later in the season. These provisional contracts were placed through fear of an advance in cotton, but, on account of the sharp competition of Southern mills, did not dare undertake the advance, and as the cotton market has flattened out, the tendency is the other way. The light weight season has been a fairly active one, and is

(Continued on page 141.)

Colchester Mills,
SPINNERS OF
Made from Colchester Mills Sanitary Random Yarn
Mule Spun Cotton Hosiery Yarns.
Sales in Charge of A. D. SALKELD, 86 & 88 Franklin St., NEW YORK.
Representing B. B. Smalley, Thos. F Patterson, F. E. Snow Receivers Colchester Mills.

WOOLEN AND MERINO YARNS.
Special line for Bicycle and Golf Goods in all shades For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
New Richmond, O.

WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER, - MASS.

A. HERBST. J. W. JONES.
HERBST & JONES,
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets,
PHILADELPHIA.

ALBERT R. ELSASSER,
Clifton Worsted Mills.
WORSTED YARNS.
Lustre Worsted a Specialty.
Mills: Addingham, Del. Co., Pa.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Plain and Gassed Cotton Yarns,
HOSIERY COTTON YARNS,
Mercerized Cotton Yarns. Harness Twines.

COTTON WARPS
White or Colored.
Toweling and Grain Bags.
Dana Warp Mill,
WESTBROOK, MAINE.

HADLEY
SPOOL COTTON AND FINE YARNS
COMPANY
COTTON SPINNERS.
MILLS AT HOLYOKE, MASS.

SPINNERS OF
FINE COTTON YARNS
30s TO 100s.
Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.
Fine Cotton Warps, single and two-ply, in chain, etc.
Spool Cotton and Seaming Thread.
95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,
WESTERLY, R. I.
Mills equipped with the latest and most improved machinery.
Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.
Also 2, 3, 4, 5 ply and 6, 9 and 12 ply cable laid.
Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.

FLYER SPUN
Mohair and Worsted
YARNS.
Mohair Plushes,
Worsted and Cotton Braids.

D. COFF & SONS, Pawtucket, R. I.
ESTABLISHED 1861.

MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
HOUSATONIC, MASS. 4s to 60s.

GREENE & DANIELS MFG. CO.,
COMBED, CARDED AND GASSED
Yarns, Threads, Twines and Chain Warps,
Colored and Bleached Yarns Furnished in any manner desired by the trade.
PAWTUCKET, R.I.

WE BUY FOR CASH!
ODD LOTS OF
YARNS AND WARPS
ENOS CROSLAND'S SONS,
Haverford Ave. and 69th St., PHILA., PA.

RICHARD CAMPION,
Selling Agent for—
Bristol Worsted Mills,
Highland Worsted Mills.
17 Bank Street, Philadelphia, Pa.

A copy of the Textile World's Directory is presented to every paip-up subscriber of the Textile World, with the compliments of the publishers.

(Continued from page 139.)

calling for 1/18s, 1/20s and 1/24s yarn in good amounts for flat goods. The fleece lined underwear continues to sell well, and many orders have been placed for 1/24s to 1/30s in random effects; and 1/8s for backing has been selling in good quantities. Many of the mills making flat goods the coming season will use 1/20s, for two threaded garments. This is done because of the demand for a firmer and smoother garment. The ribbed underwear mills have not been placing many orders for heavy weight yarn, because the trade is not ready to place orders for such goods for two or three months. The same shades, silver-gray for ladies' and Jaeger for men's wear, for the Western trade, and white for the Eastern districts of the country will rule this year.

The knitters of fine lisle underwear have been busy on 2/42s and 2/50s, in Egyptian, Allen stapled cotton, and bleached white yarn. The coming two months will be the best for this class of trade, and much yarn of this kind has been sold and delivered. The knitters of lisle yarn do not know exactly how they will stand after the present season, on account of the yarn combination, which rumor says will shut down many of the spinning mills within its control. The balbriggan underwear mills are running mostly on 1/20s combed Egyptian; and some few are making a better garment out of 1/40s, two threaded. The combination has a firm grip on the combed yarn business of the country, and knitters will have to submit.

Philadelphia Yarn Market.

The continued high price, and advance in cotton, has induced spinners to refuse orders, except at an advanced price. They are generally sold up for some little time, so they are in strong position to do this. Anyone wanting new business, of course, is obliged to pay more money. Cotton is reported generally poor, and great dif-

(Continued on page 143.)

Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

BURNET & CO.,
24 George Sq., Glasgow, Scotland.
All numbers and qualities of Cotton Yarns, specialties in
"Silkoline," "Ramie" and Fancies; also bleached filling on long tubes. Turkey reds, etc. A B C Code used. Telegraphic address "Tenrub, Glasgow."

B. F. BOYER & CO.,
Successors to GEORGE SHIMER & BOYER,
HOSIERY YARNS,
In Wool, Merino and Worsted.
GOLF YARNS,
In Wool and Worsted. Also carry a full line
BUNDLE YARNS
For the Jobbing Trade.
MILLS AND OFFICE AT
CAMDEN, - - N. J.

DANIEL S. PRATT,
180 Summer Street, - BOSTON,
ROOM 24.
851 Calle Piedad, Buenos Aires.
SOUTH AMERICAN WOOLS,
..Personally Selected..
Graded to the Standard of U. S. Markets.

WAVERLY WORSTED CO.
SPINNERS OF
WORSTED YARNS
FOR WEAVING AND KNITTING.
Main St. & Green Lane, Manayunk. Philadelphia.

Eddy & Street,
COTTON, YARNS WORSTED,
WOOLEN, AND SPUN SILK.
BRAIDS
PROVIDENCE, R. I.

Cohannet Mills,
TAUNTON, MASS.
Spinners of High Grade
HOSIERY YARNS OF EVERY DESCRIPTION.
Selling Agents JAMES E. MITCHELL & Co, Philadelphia and Boston.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:

Broadway and Jefferson Ave., Camden, N. J.

Represented by FIRTH BROADHEAD,
937 Banigan Building, Providence, R. I.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

ALL NUMBERS SINGLE AND TWO-PLY,

Worsted YARNS,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes.

Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns only.

CENAPPED YARNS of all kinds. Doup Yarns. Harness Yarns for Braids, etc.

BRISTOL, R. I.

George Campbell & Co.

Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

ficulty is experienced in getting good grades. At the best it is not as clean and as satisfactory as last year. We quote:—

Warps:—

20/1	12¼ to 12¾
22s	12¾ to 13
26s	13 to 13¼
12/2	12½
14/2	12½
16/2	12½ to 13
20/2	13 to 13½
30/2	15 to 15½
40/2	21 to 22½

Skein:—

20s soft	12½
19s soft	12½
26s	12½ to 13
4s to 10s soft	10½ to 11
12/2	11½
14/2	11½
20/2	13
30/2	14½ to 15
40/2	20 to 22
8/3 hard	10¼ to 10½
16/3 slack	11½ to 12
16/4	11½ to 12
16/2	11½ to 12

Southern cones (various qualities):—

6s to 8s	11 to 12
10s	11½ to 12½
12s	12¾
14s	13 to 13¼
16s	13½ to 14
20s	14 to 14½
22s	14 to 15
24s	14½ to 15½
26s	15 to 15½
30s	15½ to 16½

Shuttle cops:—

6s to 8s	11½ to 12
12s	11½ to 12
16s	12 to 12½
26s	12½ to 13
40s	16 to 16½

Mixed colored cones:—

6s to 8s	13 to 13½
10s	13½ to 13½
12s	14
14s	14½
16s	14½ to 15

Eastern cops:—

10s hosiery	12 to 12½
14s "	12½ to 13½
16s "	13 to 13½
20s "	14 to 14½
10s shuttle	12 to 13
14s "	12½ to 13

Eastern skein ½c. above cops.

Eastern cones ½ to 1½c. above cops.

Egyptian, carded, 5 to 6 cents above white.

Combed yarn, 5 to 6 cents above carded.

Low priced stock in most worsted mills has been used up, and indications are that prices of yarn must go up, as wool cannot be bought today to make yarn at present prices.

Woolen and worsted yarns are dull and slow of sale. Many worsted mills are using largely of cotton yarn and making a cheap line of goods. Manufacturers using woolen yarns generally spin them in their own mills. We quote wool spun cotton yarn as follows:—

20 cut black cops	12½ to 13
26s " "	15 to 15½
12s to 16s	12½

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
A. T. SKERRY & CO., 47 LEONARD ST., NEW YORK.

Meyer Silkaline made expressly for Cat Stitching Machines, in all sizes and colors on spools and cones, spun and pure, spool and embroidery silks all sizes and colors. Cotton thread on spools and cones. Send for samples prices.
JOHN C. MEYER & CO.,
87 SUMMER STREET, BOSTON.

CHENEY BROTHERS,

SILK MANUFACTURERS.

ALL KINDS OF

Knitting Silks, Ribbons AND Piece Silks,

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, in the Hank, or on Spools or Cones, for Manufacturers' Use. Silk for Special Purposes Made to Order.

MILLS: South Manchester and Hartford, Conn.

SALESROOMS: 477, 479 and 481 Broome Street, NEW YORK.
929 Chestnut St., PHILADELPHIA.
79 Chauncy Street, BOSTON.
186 Franklin Street, CHICAGO.

WILLIAM RYLE & CO.,

DEALERS IN

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Foreign and domestic

SPUN SILK YARNS AND NOILS

Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., - NEW YORK.

C. J. LITTLEWOOD & SONS, Ltd.

ALBION

DYE and BLEACH WORKS,

MANAYUNK, PA.

DYERS of Cotton, Cotton Yarns, Wool and Raw Stock Generally. **BLEACHERS** of Cotton and Cotton Yarn.

CITY OFFICE: 132 Chestnut Street. Telephone Connection,

PHILADELPHIA. MAIN OFFICE AT THE WORKS.

THE NOVELTY DYE WORKS,

BALDWIN & RUDY, Proprietors.

DYERS OF

WOOLEN, COTTON and MERINO HOSIERY YARNS,

Carpet Chain, Window Shade Cord, Drug Twine, any shade. Correspondence solicited.

Office, 234 East Fourth Street, Second Floor, **CINCINNATI, OHIO**

PROVIDENCE DYE WORKS.

Dyers and Finishers,

COTTON YARNS, Suited for HOSIERY and WEAVING Cotton, Woolen and Worsted DRESS GOODS, Woolen and Worsted Mixed CASSIMERES and CLOAKINGS, also Woolen and Worsted Slubbing, COTTON YARN and WARP DYERS and BLEACHERS.

FIRTH & FOSTER CO.,

OFFICES: **Philadelphia, 546 Bourse Building.**
New York Office, Silk Exchange, Broadway and Broome St.
WORKS: **Taylor, Emerald and Adams St., Kensington, Philadelphia, Pa.**

Boston Finishing Works

WILLIAMSTOWN, MASS.

BLEACHERS, DYERS AND FINISHERS

Of Pure Finish Shirtings, Sheetings, Canton Flannels and Filled Good
Also Silesias, Satteens, Corset Jeans, Cambrics, Sleeve Linings, Pocketings, Flannelette, and all descriptions of Dyed Goods.

NAPPING A SPECIALTY.

Being equipped with the French and other Foreign and Domestic Napping Machines we are prepared to give any kind of Nap required, including the French FlannelFinish.

R. GREENWOOD & BAULT,

GLOBE DYE AND BLEACH WORKS,

FRANKFORD, - PHILADELPHIA.

Specialists in Cotton Warps and Skein Dyeing.

HOME BLEACH AND DYE WORKS,

PETER B. McMANUS, Proprietor.

Dyers and Bleachers of Cotton Yarns,

PAWTUCKET, R. I.

Pawtucket Dyeing & Bleaching Co.,

BLEACHERS AND DYERS OF

COTTON YARNS AND STOCKINET.

OFFICE WITH BLODGETT & ORSWELL CO., Manufacturers of Glazed Yarns,
28 BAYLEY ST. PAWTUCKET, R. I.

COHOES DYE WORKS,

COHOES, N. Y.

Dyers of Raw Cotton, Wool and Knit Goods.

Satisfaction Guaranteed.
Capacity 10,000 lbs. per day. Prompt Deliveries.

FAST COLORS

For Wool, Woolen and Cotton Yarn and Piece Goods Dyeing, and for Calico Printing

ALIZARINE RED, PASTE AND POWDER.

Alizarine Blues, Oranges, Browns, Yellows, Maroon, Gray and Black.
Cœruleine, Galleine, Mythylene Grays.
Thionine Blues, Thionine Indigo, Solid Green and
PATENT BLUES (superseding Extracts of Indigo on account of fastness and color bloom) for Wool and Silk, Benzidine and Primuline Colors, Zinc Dust, Aniline Salts and Oil.

VICTOR KOECHL & CO. 122 HUDSON ST., NEW YORK.

SOLE AGENTS FOR

FARBWERKE, formerly MEISTER, LUCIUS & BRUENING, HOECHST o | M.; A. LEONHARDT & CO., Muehlheim o | M.

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New York and Boston Dyewood Company,

MANUFACTURERS OF

DYEWOOD EXTRACTS.

Sole Agents for the United States and Canada for
ACTIEN-GESELLSCHAFT FUR ANILIN-FABRIKATION, BERLIN.
Specialties for Wool, Silk and Cotton.

BENZO PURPURINE B, 4 B, 6 B; BRILLIANT PURPURINE R; BRILLIANT CONGO R, etc.
CHROME FAST BLACK B, a new fast black for wool.

NEW YORK: 55 BEEKMAN ST. PHILADELPHIA: 124 ARCH ST.
BOSTON: 117 HIGH ST. HAMILTON, ONTARIO.

Established 1834. H. G. JOHNSON, Proprietor.

Wm. G. Johnson Co.

Manufacturers of

DYEWOODS

Logwood Extracts, - - -
Ground and Bolted Camwoods
And other Fancy Woods. -

All Goods Warranted Uniform.

Long Distance Telephone. **UNCASVILLE, CONN.**

JOHN J. KELLER & CO.,

104 and 106 MURRAY STREET,
NEW YORK.

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Aniline Colors,
Dyewood Extracts,
Sumac and
Nutgall Extracts.

FAST COLORS for wool dyeing, one dip cotton colors, novelties and specialties for calico printing.

—— MANUFACTURED BY ——

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DYE STUFFS

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Boston,
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FARBENFABRIKEN OF ELBERFELD CO.

40 STONE STREET, NEW YORK.

OSTON. PHILADELPHIA. CHICAGO

Alizarine Black-Bayer

(DIAMOND BLACK.)

The Cheapest Fast Black for Wool.

C. BISCHOFF & CO.,

87 and 89 Park Place, New York. Branches, 139 S. Front St., Phila. 124-126 Purchase St., Boston.

Rhodamines, Patented.

Alizarine Blacks, Patented.

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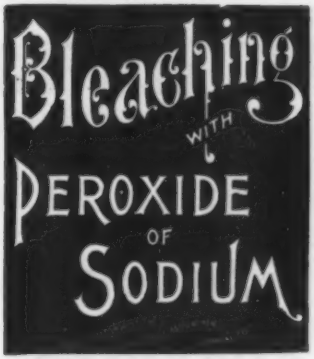

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Peroxide Works, Niagara Falls.

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IMPORTERS OF

INDIGO, CUTCH, GAMBIER, SICILY SUMAC, ANILINES, ETC.

AND DEALERS IN

Dyestuffs, Extracts and Chemicals.

Full Lines of Direct Colors for Cotton, and Acid Colors for Wool.

No. 70 Kilby Street, BOSTON.

No. 8 and 10 Letitia Street, PHILADELPHIA.

SYKES & STREET,

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Aniline and Alizarine Colors.

Aniline Oil and Salt.

Dyewood Extracts, Etc.

THE STAMFORD MANUFACTURING CO.

MANUFACTURERS OF

CUT and GROUND DYEWOODS,

Dyewood Extracts and Liquors,

FLAVINES.

Importers of CHEMICALS and DYESTUFFS.

133-137 Front Street, - New York.

ESTABLISHED 1865.

ANCHOR COLOR MANUF'NG CO.,

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ANILINES, DYESTUFFS and CHEMICALS.

Direct Colors for Cotton, Wool and Mixed Goods.

New Belgium Blue. . . .

462-466 Cherry St., NEW YORK.

OAKES MANUFACTURING CO.,

Hematine, Extracts of Dyewoods, Chemicals.

New York. Boston. Philadelphia. Atlanta.

A. KLIPSTEIN & CO.,

NEW YORK. BOSTON. PROVIDENCE. PHILADELPHIA.
CHICAGO. CINCINNATI. HAMILTON.

Dyestuffs and Chemicals.

Fast Colors for Wool.
Dry Alizarine.
Phenocyanine,
Direct Cotton Colors.
Congo Red,

Refined Cutch A. K. C.
Caustic Potash.
Azo Colors.
Napthol Yellow.

NEW CHROME MORDANT

(Amend Process)

Saving in Steam
Saving in Dyestuffs
Saving in Weight of Fibre
Improvement in Quality of Fibre
Improvement in Colors
Also Applicable to Silk.

AMEND PROCESS CO., 205-211 Third Ave.,
NEW YORK.

The STONE & WAKE CO.,

IMPORTERS AND MANUFACTURERS

Colors, Dyestuffs and Chemicals.

145 Kinzie Street, CHICAGO.
157 Malden Lane, NEW YORK,
Zurich, SWITZEREAND.
105 Reed Street, MILWKUKEE.

THE SHARPLESS DYE-WOOD EXTRACT CO.,

OFFICES: 648, 650, 651 The Bourse, PHILADELPHIA.
Warehouse: 22 N. Front St., PHILADEDPHIA. Works: CHESTER, PA.

—MANUFACTURERS OF—

DYEWOODS AND EXTRACTS.

LOGWOOD.
FUSTIC.
BARK.
BLACK DYE.
CUTCH.

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50 Kilby St., Boston, Mass.,
MANUFACTURERS OF
ACIDS, AMMONIAS, ALUMS, SODAS
And other Chemicals.

N. SPENCER THOMAS CO.

Elmira, N. Y.
Boston, Mass.
Philadelphia, Pa.

Fast One-Dip Blacks on Cotton and Wool Mixed Goods and Raw Cotton a specialty.

One-Dip Balbriggan and other Underwear shades are absolutely Fast and give a silk finish.

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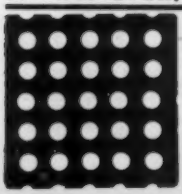

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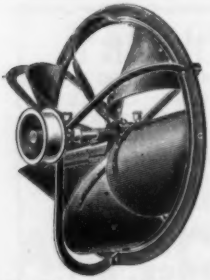

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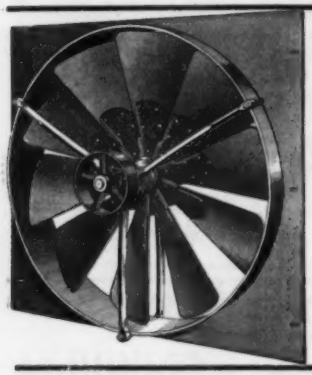

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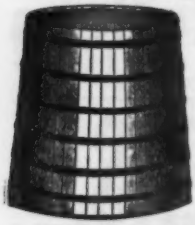

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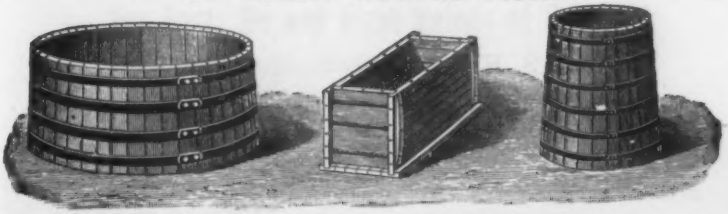

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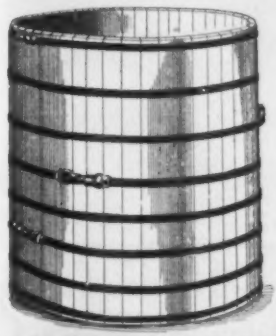

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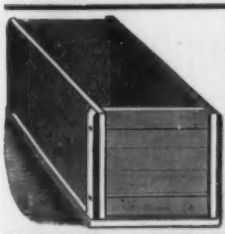

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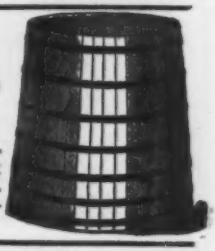

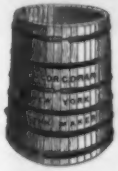

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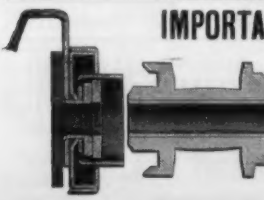

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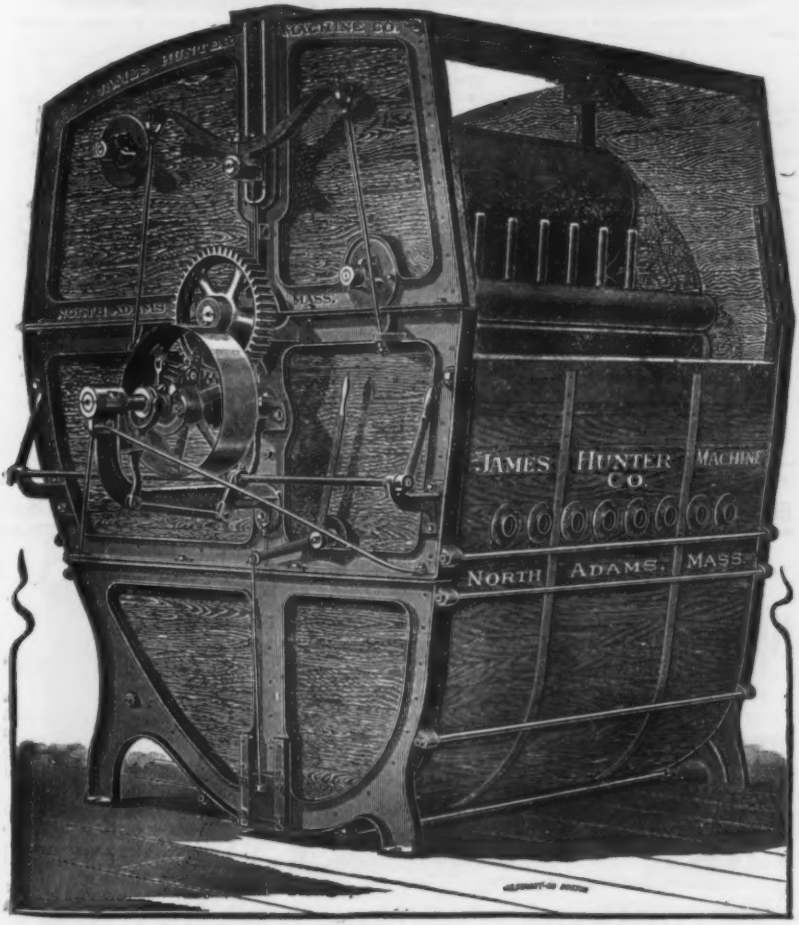

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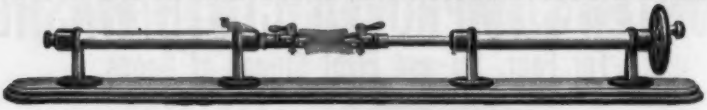

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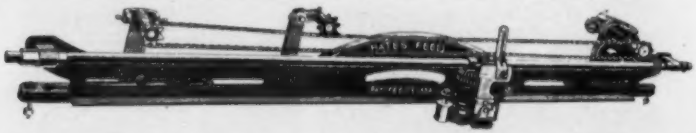

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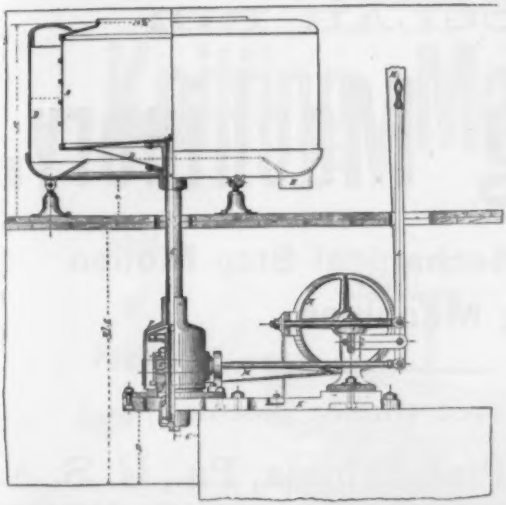

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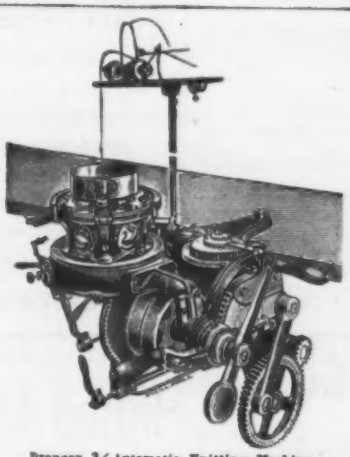

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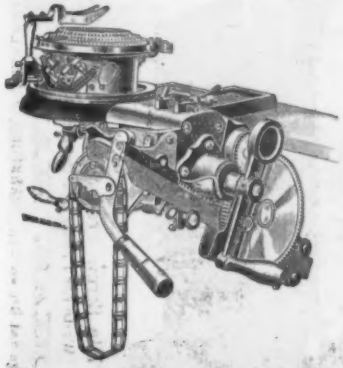

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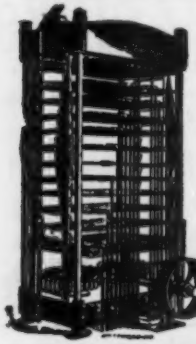

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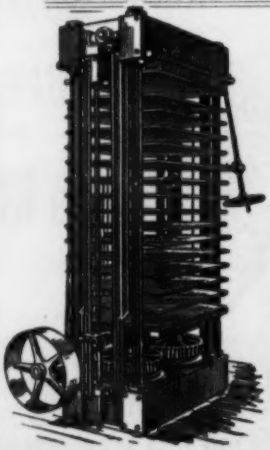

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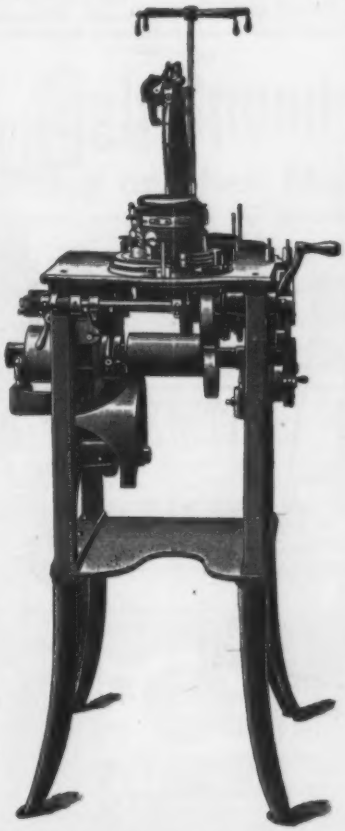

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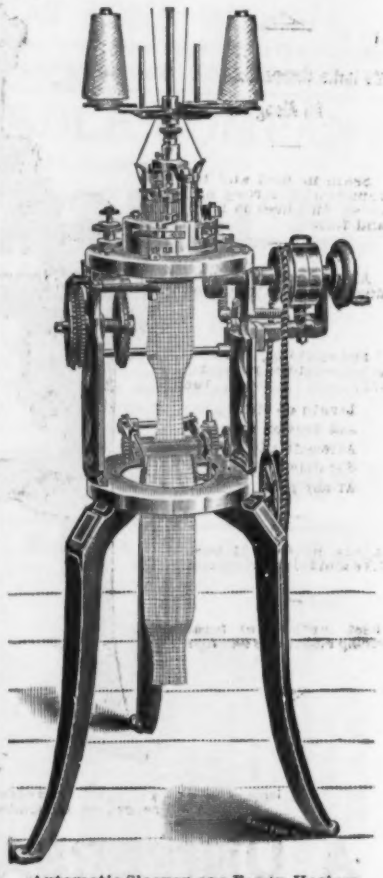

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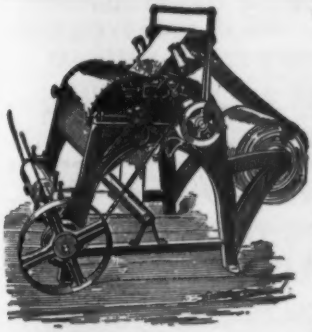

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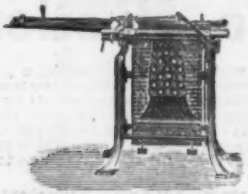

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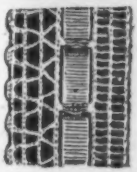

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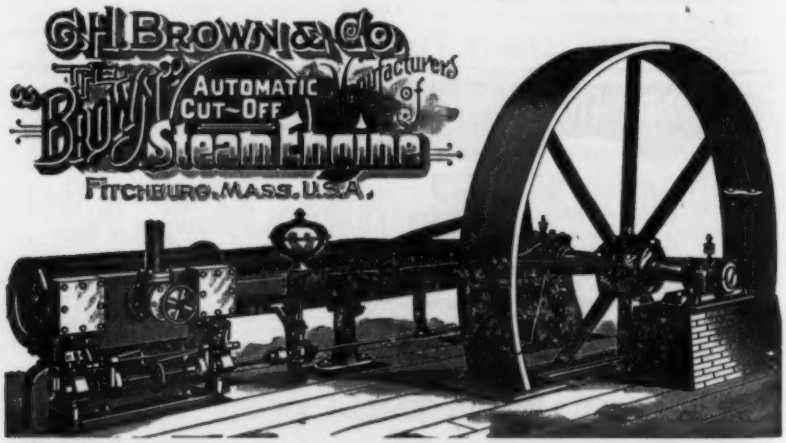

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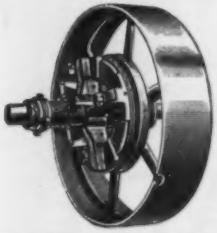

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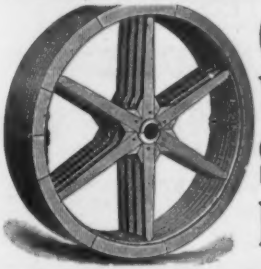

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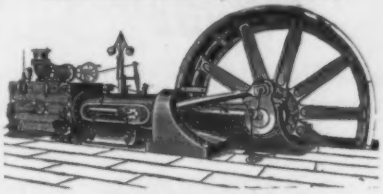

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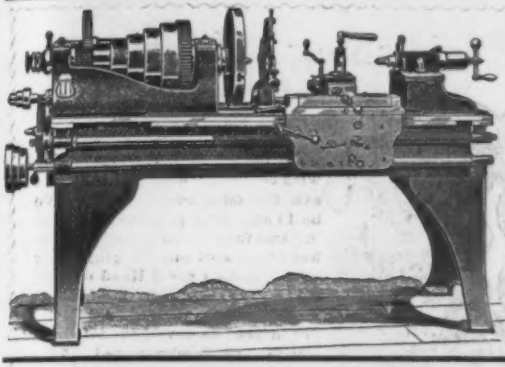

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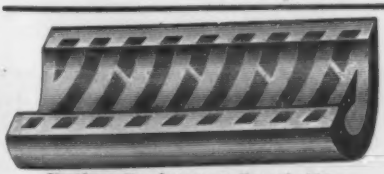

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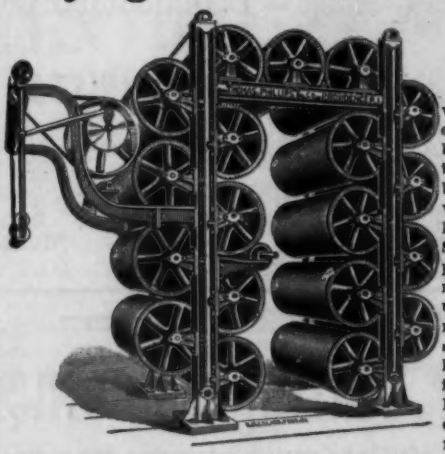

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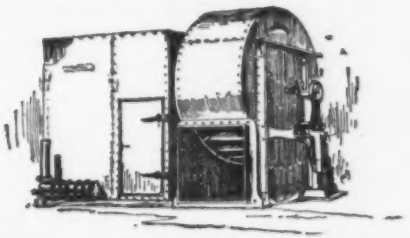

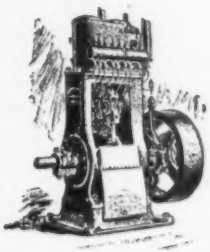

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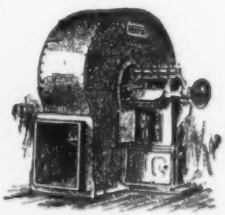

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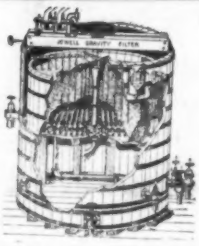

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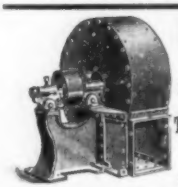

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